BC Safety Authority

Safety Authority

State of Safety Report 2013

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Message from the Chair of the Board

It is my privilege to present the 2013 State of Safety Report. This report documents the work done by BC Safety Authority (BCSA) over the past year, provides analysis of technical information gathered, and outlines our initiatives to enhance the technical safety system in British Columbia. This report also reflects the collaborative participation and support of our clients, stakeholders, government, and industry.

In 2013, we launched our 10–Year Strategy, setting BCSA on its journey to becoming a knowledge-based and risk-focused organization that provides value-added safety services to clients. By collecting, analyzing and communicating meaningful safety information, we enable informed decision making and technical safety risk management, while improving the effectiveness of our oversight at the same time. This report and its quarterly updates on our website demonstrate our commitment to delivering timely safety information to our clients, stakeholders, and the public.

To support the development of a knowledge base, we implemented a new information management system and an online client service portal called *MyConnection* in 2013. In spite of the short-term challenges this transition created for our clients and employees, we remain steadfastly committed to realizing the strategic opportunities for enhanced data querying, information sharing, and knowledge capture. We are also confident that, once optimized, the system will enhance the client experience, resulting in more efficient transactions and interactions.

I would like to thank our stakeholders and clients for their commitment to safety and for providing valuable feedback as we worked to improve our safety services over the last year. I would also like to take this opportunity to extend my appreciation to fellow Directors for their support and advice as we provided governance to BCSA during my tenure as Chair of the Board. In 2014, I will turn this role over to the incoming Chair, Richard Ballantyne, with great confidence that BC Safety Authority is in good hands. I acknowledge the work of the Executive Team in keeping the course set by our 10–Year Strategy and commend the unfailing dedication of all employees in maintaining a strong safety system for our province.

P. Cook

Peter Cook
Chair of the Board

Message from the President and Chief Executive Officer

The 2013 State of Safety Report provides our stakeholders with important safety knowledge for making risk-informed decisions with regard to regulated equipment, systems and work.

BC Safety Authority conducted nearly 40,000 physical assessments in 2013, investigated nearly 500 incidents, and issued nearly 200,000 installation and operating permits.

Information collected in the last year originates from our interactions with clients in the field and our consultations with industry leaders. We continually process this information to advance the understanding and management of safety risks and hazards; ultimately in service to our vision of *Safe technical systems. Everywhere.*

During 2013:

- We released a recommendations report based on our investigations into the tragic fires and explosions at the Babine Forest Products Mill near Burns Lake and Lakeland Mills in Prince George. This was followed by a safety order addressing combustible dust hazards in wood processing facilities. It was important to share the recommendations and the safety order to assist all involved in addressing these hazards, even as we could not release the full investigation report to avoid compromising Crown Counsel's review of a referral from WorkSafeBC.

- After close collaboration with the elevating devices industry, we launched the Elevating Devices Certification Program. The intent of the program is to establish consistent certification standards and support duty holders with their accountability in improving safety throughout the industry.

- We developed an As-Found Hazards Report to document BCSA's hazard reporting practice for understanding and managing information found during physical assessments.

- We continued to focus on carbon monoxide poisoning in our Targeted Incident Reduction Program. Information from a six-year overview is included in this report.

As we strive to enhance our capabilities as a knowledge-based, risk-focused organization, I welcome your feedback on BCSA's State of Safety information.

Catherine Roome, P. Eng.
President and Chief Executive Officer

About BC Safety Authority

Our Vision:

Safe technical systems. Everywhere.

Our Mission:

We build your confidence in safety systems for life – through a focus on risk and support for innovation.

BC Safety Authority (BCSA) is an independent, self funded organization mandated to oversee the safe installation and operation of technical systems and equipment. In addition to issuing permits, licences and certificates, we work with industry to reduce safety risks through assessment, education and outreach, enforcement and research.

What We Do

BCSA delivers safety services across the following technologies in the province:

- Electrical equipment and systems
- Boilers, pressure vessels and refrigeration systems
- Natural gas and propane appliances and systems, including hydrogen
- Elevating devices, such as elevators and escalators
- Railways, including commuter rail
- Passenger ropeways, such as aerial trams and ski lifts
- Amusement devices
- Complex and integrated technical systems involving multiple technologies.

Our Services

In order to promote safe practices, our services include:

- Assessing technical work and equipment, including collecting information through inspection, incident investigation and registering new equipment and designs.
- Certifying individuals and licensing contractors and operators to perform regulated work.
- Supporting clients in the development of alternative safety approaches, and auditing their safety management plans or equivalent standards approaches.
- Taking enforcement actions that promote an equitable safety system where all participants are compliant with regulations.
- Educating our clients and the public about technical safety to better control risks.
- Conducting research, including contributing to provincial and national code development and updating regulations for the technologies we serve.

Our Legislative and Regulatory Framework

BCSA operates within a legislative and regulatory framework that includes:

- *Safety Authority Act*
- *Safety Standards Act and Regulations*
- *British Columbia Railway Act, Railway Safety Act and Regulations*
- *Administrative Tribunals Act*
- *Freedom of Information and Protection of Privacy Act*
- *Ombudsperson Act*
- *Offence Act*

For further information, including our 10-Year Strategy, Annual Report, and Business Plan, please visit our website at www.safetyauthority.ca.

About the State of Safety Report

BC Safety Authority (BCSA) receives reports of incidents and conducts assessments of regulated equipment and work[1]. Through investigation and assessment, BCSA advances the knowledge of safety risks and focuses attention toward managing those risks.

The 2013 State of Safety report is the tenth publication of its kind from BCSA. In accordance with the administrative agreement between the Government of British Columbia and BCSA, the State of Safety report provides:

- Analysis of incident and injury trends in all sectors regulated by BC.
- Explanations for incident and injury trends, particularly significant deviations.
- Comparisons, where possible, between BC incidents and those of other jurisdictions.
- Responses to information gathered from investigations, including understanding causes and taking necessary action to resolve systemic problems.
- A summary of risk-based initiatives to educate and communicate with the general public, clients and stakeholders of BCSA safety services.
- A summary of national committees and inter-provincial working groups where BCSA has participated and provided leadership.
- A listing of enforcement actions taken by BCSA.

This report is organized into two main sections. Each section aims to provide an understanding of safety hazards observed in 2013 followed by the efforts led by BCSA to manage those hazards.

The first section provides an overall summary of hazards and safety management efforts at an organizational level while the second section provides a similar analysis specific to each industry sector regulated by BCSA.

1 Certain municipalities administer portions of the *Safety Standards Act* in lieu of BC Safety Authority. These municipalities and their scope of administration are detailed in Appendix H.

Understanding Safety Risks in BC

Incidents

Incidents involving work or equipment regulated under the *Safety Standards Act* are required to be reported to the appropriate Provincial Safety Manager. BCSA investigates many of these incidents to gain an understanding of safety hazards in BC and what actions can be taken to manage those hazards. Figures 1-1 and 1-2 below show the total number of incidents reported to BCSA in 2013 and previous years.

FIGURE 1-1: Incident reports 2009-2013

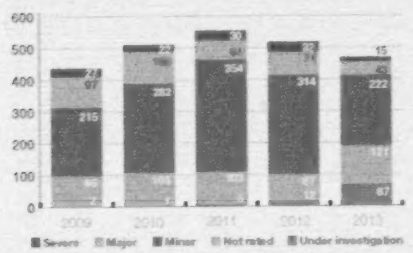
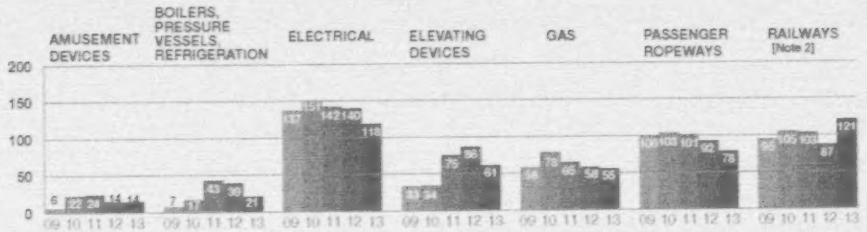


FIGURE 1-2: Incident Reports by Regulated Industry Sector 2009-2013



Note 1: Incidents identified as *UNDER INVESTIGATION* were open at the time of report preparation.
Note 2: Railway accidents and incidents are not given a rating and are identified as *not rated* in Figure 1-1.

TABLE 1-1: Severe and Major Incidents in 2013

SEVERE		MAJOR	
Qty	Type	Qty	Type
9	Explosions and/or fires where regulated equipment was involved or suspected to be involved	23	Explosions and/or fires where regulated equipment was involved or suspected to be involved
4	Elevated carbon monoxide/ carbon monoxide hazards	10	Trips, falls or other unintended contact with regulated or energized equipment
1	Equipment malfunction	4	Elevated carbon monoxide/ carbon monoxide hazards
1	Light fixture fell from elevator cab ceiling	4	Component/equipment failure/malfunction
		2	Arc flash
		1	Gas odour reported
		1	Incorrect use of equipment

In 2013, there were no significant changes in the overall number and types of incidents reported to BCSA. Residential fire-related incidents and residential carbon monoxide exposures were the predominant types of *SEVERE* and *MAJOR* incidents reported, which is consistent with previous years. At the time of compiling this report, five potentially *SEVERE* and 13 potentially *MAJOR* incidents remained under investigation. More information including basic descriptions of closed incidents occurring in 2013 is available in Appendix A.

Injuries

Injuries reported as a result of incidents are an important indicator of hazards inherent to the operation of regulated equipment. Injuries resulting from the incidents reported above are summarized below.

FIGURE 1-3: Injuries Reported 2009-2013

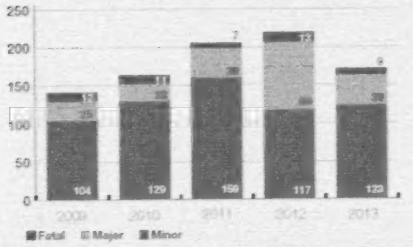
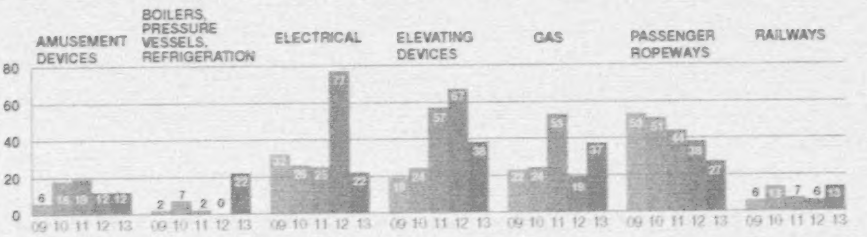


FIGURE 1-4: Injury Reports by Regulated Industry Sector 2009-2013



Note 1: Injuries associated with incidents *UNDER INVESTIGATION* are excluded.
Note 2: Injury information is provided to BCSA by first responders and voluntary reports at the time of the investigation. Injury information is provided in this report to provide some context of the scale (size) of the failure.

TABLE 1-2: Fatal and Major Injuries 2013

FATAL		MAJOR	
Qty	Type	Qty	Type
5	Fatalities from fires or explosions	18	(Possible) concussions, fractures, dislocations and soft tissue injuries
4	Fatal carbon monoxide poisoning/exposure	15	Carbon monoxide poisoning/exposure
		3	Injuries resulting from fire/explosion incident (burns, loss of consciousness, possible stroke)
		2	High-voltage contact injuries (e.g. burns requiring surgery, loss of consciousness, electrical shocks)
		1	"Head injuries" (sic) from escalator incident

While the number and types of incidents was consistent with previous years, there was a significant reduction of reported *MAJOR* injuries in 2013. Elevated numbers of *SEVERE* and *MAJOR* injuries were reported in 2012 due to two atypical incidents – sawmill explosions. The numbers and types of *SEVERE* and *MAJOR* injuries reported to BCSA in 2013 are generally consistent with other reporting periods. Fatalities were a result of fire-related incidents and carbon monoxide poisoning. *MAJOR* injuries resulted from unintended contact with regulated equipment or carbonmonoxide exposure, which is consistent with previous years. At the time of compiling this report, incidents involving four *FATAL* (electrical shock and fire related) and four MAJOR injuries remained under investigation. More information about injuries resulting from closed incidents is available in Appendix A.

Assessments of Regulated Work

BCSA assesses regulated activities and equipment to determine the state of compliance. Where permitted work is completed by licensed businesses and qualified persons, compliance declarations are submitted by those duty holders and BCSA's assessment effort is focused on activity or equipment that is perceived to carry a greater risk of incident or injury.

FIGURE 1-5:
New Installation Permits 2009-2013

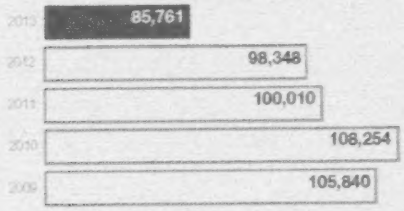


FIGURE 1-6:
Operating Permits 2009-2013

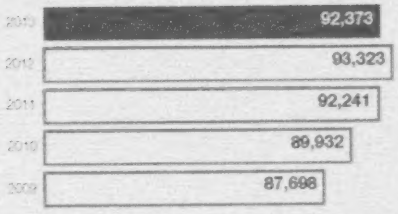


FIGURE 1-7:
Physical Assessments 2009-2013

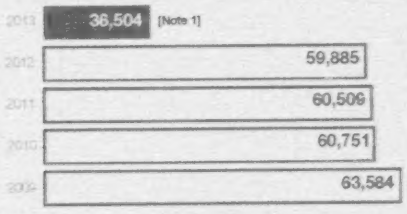


FIGURE 1-8:
Non-Compliances 2009-2013

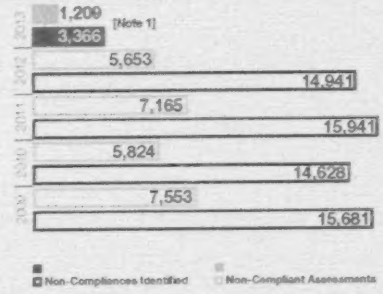


Fig 1-7 Note 1: See management discussion below for interpretation of reduced physical assessments in 2013.
Fig 1-8 Note 1: The 2013 column represents non-compliance information recorded on physical assessments that occurred January 1 to April 14, 2013 only. Due to an enterprise-wide, production information system change, the record of non-compliance information has changed and will no longer be relatable to findings pre- April 15, 2013. Going forward, BCSA will establish a more consistent and meaningful measure of regulatory compliance and impc ntly, it is working to improve risk understanding by establishing a process for documenting hazards found during assessments of regulated work. For further information, see management discussion below.

TABLE 1-3: Permitted Work, Physical Assessments Completed and Non-Compliances Recorded in 2013

	AMUSEMENT DEVICES	BOILERS, PV, REFRIGERATION	ELECTRICAL	ELEVATING DEVICES	GAS	PASSENGER RUNWAYS	RAILWAYS	TOTAL
New Installation Permits (Note 1)	69	712	49,476	1,534	33,947	23	N/A	85,761
Operating Permits (Note 2)	551	55,182	11,367	23,050	1,877	235	111	92,373
Physical Assessments (Note 3)	293	5,072	19,793	2,831	8,240	170	105	36,504
Non-Compliant Assessments (Notes 4, 5)	N/A	290	2,267	N/A	809	N/A	N/A	3,366
Non-Compliances Identified During Assessment (Notes 4, 6)	259	NA	NA	527	NA	168	255	1,209

Note 1: New installation permits include permits issued in 2013 only. This number does not include permits that were issued in previous years and may have been assessed in 2013.
Note 2: Operating permits includes new permits issued in 2013 and permits that were issued in previous years and were still active in 2013.
Note 3: Physical assessments include all physical assessment activity performed by BCSA officers in 2013 for all new or active installation and operating permits.
Note 4: Represents non-compliance information recorded on physical assessments that occurred January 1, 2013 to April 14, 2013 only. See management discussion below.
Note 5: Physical assessments where one or more non-compliances were identified.
Note 6: Number of non-compliances identified during physical assessments.

Management Discussion

Temporary Reduction in Physical Assessments

Figure 1-7: Physical Assessments 2009-2013 depicts a significant decrease in physical assessments in 2013. This reduction is temporary and is a result of diverting inspection resources from high volume inspections towards:

- the introduction of a new operations management information system; and
- training and inspections of sawmills and wood processing facilities.

On April 15, 2013, BC Safety Authority transitioned the bulk of its permitting and assessment operations to a new information system. The magnitude of this change resulted in months of performance trouble shooting, fix implementation, and debugging. Significant attention was diverted to focus on learning how to use and improve the new system, as well as teach clients how to perform transactions using our new on-line service portal.

BCSA inspection resources were also diverted toward the training and inspecting of sawmills and wood processing facilities. This effort was part of our response to enforce a safety order issued as a result of our investigation into two tragic mill explosions in 2012. While this situation contributed to lower inspection volumes, the importance of spending adequate time in sawmills at the beginning of this prevention effort cannot be understated.

Results of Physical Assessments

In past reports, BCSA reported volumes of non-compliances relative to physical assessments. With the introduction of our new IT

system, we have decided to discontinue communicating 'non-compliance' as a result of assessments in the State of Safety Report. Compliance to codes, standards and the *Acts* and *Regulations* will always remain as an obligation for duty holders to fulfill and we will continue to enforce where non-compliances found warrant corrective action.

BCSA will work to introduce in subsequent versions of the State of Safety 'failed inspections' and 'As Found Hazards' to better communicate how duty holders have completed work subject to the *Safety Standards Act*. Each of these will be structured to ensure consistency of reporting across industry sectors.

Prioritizing Inspections

BCSA has been developing and working with a Resource Allocation Program (RAP). Currently, this tool produces a prioritization score for inspections and permits involving electrical and gas installation contractors, where the bulk of our inspection demand resides. The priority assigned to installation contractor assessments is influenced by various rating factors, including:

- Type of equipment or work,
- Past frequency of inspection, and
- Past findings of compliance or hazards.

Over the past three years, inspections of work corresponding to high priority RAP ratings has remained an important area of focus, as illustrated below.

Fig 1-9 Note 1: the Electrical Contractor - High RAP Inspection Rate achieved in 2013 includes the priority inspection of homeowner performed work, and field-assembled mobile homes and equipment (silver labels) which accounts for approximately 20% of the 2013 rate.

FIGURE 1-9:
Electrical Contractor – High RAP Inspection Rates

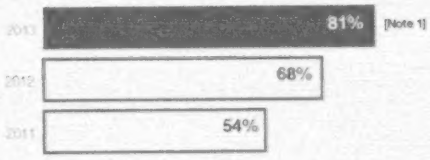
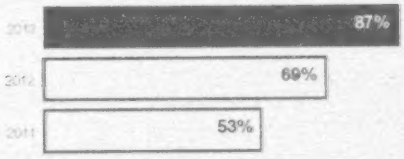


FIGURE 1-10:
Gas Contractor – High RAP Inspection Rates



We are committed to the further development and usage of RAP throughout our inspection programs. In 2014, RAP development and deployment is planned for the Boilers and Pressure Vessels program to promote greater accountability and consistency among safety officers and across regions.

Safety Information

In 2013, BCSA began to regularly publish incident and injury data on-line. Stakeholders are now able to access 'year-to-date' incident information throughout the year and in advance of the annual report by visiting our website at: http://www.safetyauthority.ca/safety-information/incident-data. This initiative represents an important step on our part to bring safety information to the public in a timely manner, enabling a sharing of safety knowledge and leadership. We intend to increase and improve the sharing of safety information gathered during our operations.

As in previous years, one of the leading types of incidents that results in major and/or severe injuries from elevated carbon monoxide exposure. To better understand this trend, a six-year data analysis was conducted. Results are summarized in the Gas industry section under *Carbon Monoxide Incidents (2007 to 2012)*.

"As Found" Hazard Reports

It is imperative that certified and licensed duty holders in the safety system understand the hazards they create while conducting regulated work. This way, they can learn to implement better ways to prevent and manage hazards effectively. The first step is awareness. BCSA has begun implementation of a new hazard reporting practice. During each assessment of regulated work, safety officers will rate and describe the most notable hazard, if any, found during the assessment. These are termed "As Found" hazards and represent a hazardous condition created by a duty holder which would likely have been left uncorrected if it had not been discovered, and may be recreated by others operating comparable equipment or conducting similar work.

Hazards will be rated and reported in accordance with the following scale:

RATING	LABEL	DESCRIPTION
0	COMPLIANT	No hazards were observed during the assessment and the work was found to comply with the codes and regulations.
1	INSIGNIFICANT	These hazards are considered to be typical and are not considered to present a significant concern to safety. Duty holders are encouraged to improve so as to prevent these from being created as a result of their work.
2	MINOR	
3	MODERATE	These hazards are considered to present an appreciable concern to safety. The safety system is considered compromised if duty holders do not take steps to understand and prevent these hazards.
4	MAJOR	These hazards are known to present considerable safety risks. The safety system of qualified and licensed professionals working under permit to recognized codes and standards is considered to have failed when hazards of this nature are found.
5	SEVERE	

Information system changes for capturing observed hazard conditions found during assessments have been successfully implemented. BCSA will introduce improved reporting of hazards found during assessments in subsequent monthly and annual reporting. These hazards and their occurrences will be related to the amount and type of regulated work reported in the safety system. Descriptions associated with the more hazardous findings will be included in a manner similar to incident reporting.

Managing Safety Risks in BC

Stakeholder Engagement Program

BCSA's Stakeholder Engagement Programs are designed to promote relationships with clients, professionals and associations that lead to greater insight into their technical safety needs.

The number of engagement activities in 2013 was comparable to results from 2012. While there was an increase in the number of Technology Advisory Committee (TAC) meetings due to the reinstatement of a TAC in the amusement devices sector, and an increase in participation by BCSA staff on national code and standards committees, these increases were offset by the relatively low number of as-needed consultation issues.

As-needed consultation issues included two industry impact assessments: one on clarifications to requirements for third class power engineering qualifications; and, one on identification and mitigation of combustible dust hazards in wood processing facilities containing electrical or gas equipment. There were also five consultations on fee setting or re-structuring. Listings for Stakeholder Engagement activities are included in Appendix D.

TABLE 1-4: Stakeholder Engagement Activities

ACTIVITIES	AMUSEMENT DEVICES	BOILERS, PV, REFRIGERATION	ELECTRICAL	ELEVATING DEVICES	GAS	PASSENGER ROPEWAYS	RAILWAYS	TOTAL 2013	REFERENCE POINT TOTAL
Technology Advisory Committee (TAC) Meetings	2	4	4	3	4	2	N/A [Note 1]	19	16
TAC Working Groups	1	3	3	2	5	2	N/A [Note 1]	16	18
Safety Standards Administrators Group Meetings	N/A	N/A	3	N/A	2	N/A	N/A	7 [Note 2]	11
As-needed consultation issues [Note 3]	1	2 [Note 4]	2	1	1	1	0	8	16
Advisory Panel of Stakeholder meetings	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A [Note 5]
Associations and National Codes and Standards Committees [Note 6]	3	11	5	10	12	3	3	47	35

Note 1: In Railways, town hall meetings achieve the intent of the TAC meetings and risk reduction working groups.
Note 2: Includes two meetings of administrators (non-technical related meetings).
Note 3: Represents the number of issues consulted, not the number of consultation sessions held.
Note 4: Consultations for Alternative Safety Approaches included multiple technologies but is counted once only under the figure for this technology.
Note 5: The Advisory Panel of Stakeholders was established in 2013 to create an opportunity to dialogue with and obtain advice from key business leaders on strategic issues.
Note 6: Number of active committees that BCSA employees are on, not the number of sessions held. A listing of Associations and National Codes & Standards Committees are contained in Appendix D.

Education Program

BCSA shares knowledge of hazards, best practices, and regulation and standard changes with industry stakeholders through the Client Education program. This program facilitates presentations, discussions and forums called "Tech Talks" as well as a number of public education projects aimed at increasing awareness about specific hazards. The following table summarizes the education program activities and results in 2013.

TABLE 1-5: Education Program Activities [see Note 1 below]

	ELECTRICAL TECH TALKS	GAS CARBON MONOXIDE	GAS TECH TALKS	ELECTRICAL THINK PERMIT	2013 TOTAL	10 YR (2004-13) TOTAL
Direct Reach	570 In-Person Attendees, 5585 Video Views	5265	92 In-Person Attendees	12	**11,524**	13,494
Indirect Reach		1,806,185		22,786,240	**24,592,425**	1,543,222
Activities	14	25	7	5	**41**	132
New Development	2	3	2		**7**	9
Media		4			**4**	5
Collaborations		3		6	**9**	168

Note 1: Definitions and descriptions for education terms (e.g., direct reach, indirect reach) are available in Appendix E.

In 2013, education program development and delivery focused on deepening existing connections, broadening program reach, and ensuring satisfaction with the quality of content provided. This was accomplished through:

- Deepened connections between BCSA and client groups through continuing the Tech Talks program in both Electrical and Gas technologies;
- Broadened reach of BCSA public education messages (i.e. used digital campaigns, local events and ads targeted to BC homeowners);
- Continued programmatic development of new content in existing programs (i.e., development of 34 Electrical Tech Talk videos and four carbon monoxide safety videos); and,
- Increased collaborations with organizations closely linked to BCSA's target audiences for public awareness messages (e.g., BC Parks, Travel BC, RONA, Home Depot, Home Hardware, The Canadian Association of Home and Property Inspectors, and municipal government offices).

Media Relations and Communications

BCSA handles media requests and issues proactive media releases to: warn of specific hazards; advise the public of steps they can take to reduce their risk of injury; and, provide comment and context to safety issues that are of interest to the media. In 2013, BCSA responded to media inquiries and conducted media relations relating to each industry sector.

TABLE 1-6: Media Relations Summary

	AMUSEMENT DEVICES	BOILERS, PV, REFRIGERATION	ELECTRICAL	ELEVATING DEVICES	GAS	PASSENGER ROPEWAYS	RAILWAYS
Media releases issued or interviews conducted in 2013 [Note 1]	**7**	**8**	**20**	**7**	**17**	**6**	**6**
Reference: Media relations activity in 2012	2	2	10	3	11	2	2

Note 1: In several cases, a media relations action may relate to two or more technologies. For example, a media release about enforcement actions would relate to all technologies, excluding Railways. Details of each media release are provided in Appendix F.

Licensing and Certification

BCSA issues licences to businesses that perform regulated work. BC Safety Authority also issues certificates of qualification to individuals that demonstrate a required level of knowledge and experience. Licensing and certification assures that minimum standards of knowledge and capability are maintained regarding the completion of regulated work.

TABLE 1-7: New Licences and Certificates of Qualification Issued

	AMUSEMENT DEVICES	BOILERS, PV, REFRIGERATION	ELECTRICAL	ELEVATING DEVICES	GAS	PASSENGER ROPEWAYS	RAILWAYS	2013 TOTAL	REFERENCE 2012 TOTAL
New Licences	30	73	348	2	260	2		**715**	842
New Certificates of Qualification	0	883	604	167	772	6	Note 1	**2432**	2,529

Note 1: The *Railway Safety Act* does not define the use of Licences or Certificates of Qualification.

Enforcement

BCSA enforces compliance with the *Safety Standards Act* where individuals have resisted attempts to make their work or equipment compliant and/or have chosen to operate outside the safety system. Safety officers work with industry to establish compliance and address unsafe conditions. However, where those efforts do not achieve results, BCSA may issue a compliance order or warning notice and, eventually, a sanction (such as a monetary penalty or discipline order) in accordance with the *Safety Standards Act*. A listing of all enforcement actions taken by BCSA is included in Appendices B1 and B2.

TABLE 1-8: Enforcement Actions Taken

	AMUSEMENT DEVICES	BOILERS, PV, REFRIGERATION	ELECTRICAL	ELEVATING DEVICES	GAS	PASSENGER ROPEWAYS	RAILWAYS	2013 TOTAL	REFERENCE 2012 TOTAL
Compliance Orders	0	8	15	7	21	2		**53**	122
Sanctions	0	0	6	1	7	2	Note 1	**16**	7
Warning Notices	0	0	32	0	4	0		**36**	N/A

Note 1: Listed categories of enforcement actions are not defined in the *Railway Safety Act*.

Regulatory Instruments and Amendments

BCSA uses certain regulatory instruments to assist with the administration of the *Safety Standards Act* and the *Railway Safety Act*. Safety orders are issued to prevent or reduce the risk of personal injury or damage to property. Directives are instruments that clarify or provide new interpretation of a regulation or code. Compliance with safety orders and directives is mandatory and enforceable by BCSA. Information bulletins provide helpful information and clarification on existing regulations or codes. BCSA also works with the Government of British Columbia to amend the Acts and Regulations. Amendments have been initiated by BCSA through a recommendation for amendment submission to the provincial government. A listing of all regulatory instruments issued and recommendations and amendments made by BCSA is included in Appendix C.

TABLE 1-9: Regulatory Instruments and Amendments

	AMUSEMENT DEVICES	BOILERS, PV, REFRIGERATION	ELECTRICAL	ELEVATING DEVICES	GAS	PASSENGER ROPEWAYS	RAILWAYS	TOTAL	REFERENCE 2012 TOTAL
Safety Orders	0	0	1 [Note 1]	1	1	0	0 [Note 2]	**4**	0
Directives	0	3	1	1	2	1	2 [Note 3]	**10**	13
Bulletins	0	2	5 [Note 4]	2	4	0	5 [Note 5]	**18**	9
Recommendations for Amendment	0	0	0	1	0	0	0	**1**	5
Amendments	0	1	0	1	0	0	0	**2**	1

Note 2: Safety orders are not enabled under the *Railway Safety Act*.
Note 3: These are called emergency directives under the *Railway Safety Act*.
Note 4: Includes two information bulletins issued jointly with the gas technology and one information bulletin issued to all technologies.
Note 5: Includes one Railway safety advisory.

Safety Order – Combustible Wood Dust

As a result of the investigations into Babine Forest Products and Lakeland Mills sawmill explosions in 2012, BCSA learned that many wood processing facilities may have equipment installed in locations deemed hazardous because of the potential presence of combustible dust. Unacceptable levels of combustible wood dust present a potential combustion hazard when the regulated equipment is not suitable for use in such a potentially hazardous location. In 2013, in response to the recommendations from the incident investigations, BCSA issued a safety order to the industry requiring operators of wood processing facilities to:

- Use qualified persons to assess their mill and operation to identify any hazardous locations that contain regulated equipment;
- Determine if the regulated equipment is suitable for use in that hazardous location;
- Implement a dust management plan to either modify the equipment or manage the dust environment; and
- Implement a management of change process to maintain a safe environment for regulated equipment.

BCSA has been conducting physical assessments of the management plans at facilities with significant electrical or gas installations and is working with operators to better understand and manage the potential hazards due to combustible dust. The physical assessments of all sites will be completed in 2014.

TABLE 1-10: Safety Order Distribution and Assessment Summary

ACTIVITY	QTY
Number of wood processing facilities in receipt of the safety order	402
Number of wood processing facilities required to respond to the safety order	227
Number of wood processing facilities that have responded as required	227
Number of physical assessments performed by BCSA (to end 2013)	68

Code and Standard Development

BCSA employees participate with and lead many technical code and standard developments. Participation in these processes brings BCSA's focus on risk to the discussion and assures that challenges facing BC industries are presented and considered. A listing of all industry associations and national codes & standards committees in which BCSA participated for 2013 is included in Appendix D.

Alternative Safety Approaches

BCSA's Alternative Safety Approach (ASA) enables an owner or primary operator to address the undertaking of particular regulated work or the use of a particular regulated product through an alternate approach consistent with the safety objectives of the *Safety Standards Act*, instead of through traditional prescriptive requirements. An ASA is required to address the specific risks that may be associated with the regulated work or product and to demonstrate how the alternative approach meets or exceeds the objectives of the *Safety Standards Act*.

The benefit of an ASA is that it allows the proponent to use the most suitable methods for efficient and safe operation of the specific business. Where innovation has outpaced the development of standards and/or regulations, industry can now integrate new technology and new approaches through an effective management system. The introduction of a complete safety system with formal audit and investigation processes, rather than individual regulatory requirements with traditional inspection processes, allows for a more complete management of safety risks.

ASAs are a new, innovative regulatory approach, offering a valued service. ASAs are being developed with owners and operators in the oil and gas, propane, bio-energy and institutional sectors.

Management Discussion

BC Safety Authority organizes its risk management activities within the framework of an Accident Prevention Model comprised of four pillars; Education & Outreach; Assessment; Enforcement; and Research. The outputs of prevention activities in 2013 are summarized above. One of the tools BCSA uses to align its efforts to concerns within the safety system is the Technical Risk Register. The Technical Risk Register defines the risk or concern as well as the actions being developed to work toward mitigation. BCSA has included this Technical Risk Register in Appendix G.

The transition to the new information system on April 15, 2013 required field resources to focus on user training and system stabilization. This necessary diversion of resources resulted in the temporary reduction in year-over-year activity in areas including field assessments, educational Tech Talks, and compliance orders. With regular rollout of system enhancements in 2014, and as clients shift their transactions to the new on-line service portal; BCSA will shift resources to focus on high risk and greater value-adding activities.

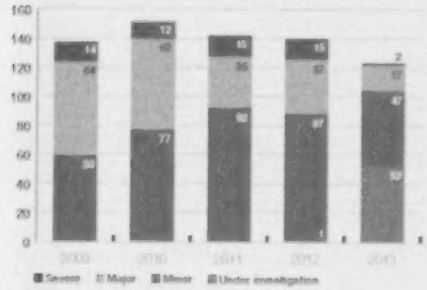
Learning from investigations into two tragic sawmill explosions in 2012 focused a considerable amount of this year's attention on the implementation of safety orders directed toward improving safety in wood processing facilities in BC. Safety officers worked with industry to develop and implement procedures for conducting hazardous location assessments due to combustible wood dust, and achieve compliance with electrical and gas codes.

Information related to combustible dust hazardous locations and regulatory compliance can be found on the combustible dust webpage at http://www.safetyauthority.ca/combustible-dust. Increased inspections of wood processing facilities related to this safety order will continue throughout 2014.

Understanding Electrical Safety Risks

In the Electrical Safety Program at BCSA, we are responsible for overseeing the safety of electrical systems across BC in accordance with the *Safety Standards Act* and the Electrical Safety Regulation. We are responsible for delivering electrical safety services for approximately 50% of the provincial permitting activity. Municipalities that have separate administrative agreements with the province are identified in Appendix H.

FIGURE 2-1:
Electrical Incident Reports 2009-2013



Incidents

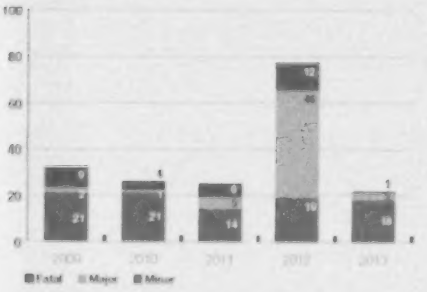
The following summarizes incidents reported to BCSA involving electrical (EL) equipment.

TABLE 2-1: Severe and Major Electrical Incidents in 2013

RATING	QTY.	DESCRIPTION
Severe	2	Fires where electrical equipment was suspected to be involved
Major	13	Fires where electrical equipment was involved or suspected to be involved
	2	Arc flash incidents
	2	Contact with energized equipment

There were fewer incidents reported to BCSA in 2013 than in previous years. While there were significantly fewer *SEVERE* and *MAJOR* incidents identified, many incidents remained 'under investigation' at the time of compiling this report. Nearly half of the 66 incidents where the investigation was completed in 2013 were fires at residences where electrical equipment was suspected to have been involved, and almost one third of the incidents occurred at industrial facilities. Thermal or mechanical damage to conductor insulation, due to operating conditions or maintenance practices, was a common factor for many incidents at industrial and residential facilities. Other incidents included arc flashes and unintended contact with energized electrical equipment. A summary of closed incident investigations is included in Appendix A.

FIGURE 2-2:
Electrical Injuries Reported 2009-2013



Injuries

Injuries reported as a result of electrical incidents are summarized below.

TABLE 2-2: Fatal and Major Injuries Reported in 2013

RATING	QTY.	DESCRIPTION
Fatal	1	Fatal injuries from fire-related incident.
Major	2	Injuries from high voltage contact incident (Second and third-degree burns requiring surgery, electrical shocks, loss of consciousness)
	1	Possible stroke resulting from fire incident

There were fewer *FATAL* injuries reported in 2013 than in previous years. It is noted that many incidents remained 'under investigation' at the time of compiling this report and as such, their associated injuries are not included. One fire-related incident resulted in one fatality, a *MAJOR* injury and six *MINOR* injuries. Other *MINOR* injures were predominantly related to smoke inhalation from fire incidents or electrical shocks and burns from unintentional contact with energized electrical components.

Assessments of Regulated Work

Electrical safety officers assess new installations as well as operating equipment as part of regular maintenance. Non-compliances are recorded when work does not conform to the applicable regulation.

FIGURE 2-3: EL Installation Permits

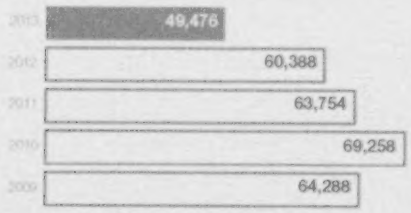


FIGURE 2-4: EL Operating Permits

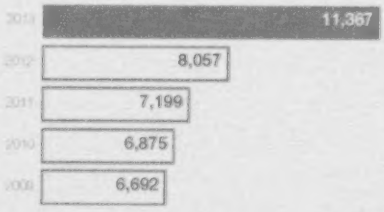


FIGURE 2-5: EL Physical Assessments

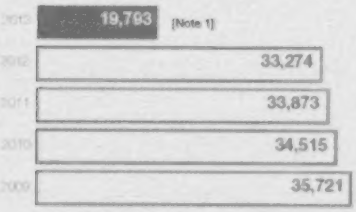


FIGURE 2-6: EL Non-Compliant Assessments

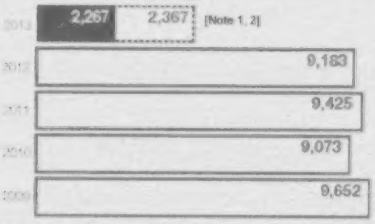


Fig 2-5 Note 1: See management discussion on page 9 for interpretation of reduced physical assessments in 2013.
Fig 2-6 Note 1: The 2013 column represents non-compliant assessments recorded from January 1, 2013 to April 14, 2013. Due to an enterprise-wide, production information system change, the record of non-compliance information has changed and will no longer be relatable to findings pre- April 15, 2013. Going forward, BCSA will establish a more consistent and meaningful measure of regulatory compliance and importantly, it is working to improve risk understanding by establishing a process for documenting hazards found during assessments of regulated work. For further information, see the management discussion on page 9.
Fig 2-6 Note 2: The dotted portion of the 2013 row represents the number of failed physical inspections recorded from April 15, 2013 to December 31, 2013. In the Electrical Safety Program, failed physical inspections may be considered comparable to non-compliant assessments.

Each inspection request is assessed by safety officers, and inspections are prioritized according to various factors. The Resource Allocation Program (RAP) provides first level filtering for assessments of installation permits. The RAP score is generated through an algorithm that utilizes historical data such as past history of compliance, scope of electrical work, type of inspection, and time since the last inspection. The resulting RAP score provides safety officers with a consistent and quantifiable result that can be used to assess and prioritize the need for site inspections. Safety officers carried out 19,793 physical assessments in 2013. Of those inspections, 77% were found to be fully compliant, and 23% were cited as non-compliant. While the majority of non-compliances were not considered high risk, safety officers identified 52 high risk hazards during their physical assessments. We continue to monitor non-compliance trends, through assessment reports; the integration of "as found conditions" will provide additional information about potential hazards being created by non-compliances. Analysis of these reports will promote development of further refinements to best determine effective and efficient deployment of BCSA resources, and development of mitigation plans that drive change for improved electrical safety.

The most common non-compliances were attributed to poor compliance monitoring practices by Field Safety Representatives, unapproved equipment, and poor maintenance practices by equipment owners.

Managing Electrical Safety Risks

Stakeholder Engagement

As a result of investigation findings collected from explosions and fires at two BC sawmills in 2012, and in support of recommendations following the investigation, BCSA consulted the wood processing industry to gain feedback on implementation of these recommendations within the proposed timeframe through a safety order. Safety order SO-EL-GA-2013-02 was issued in May 2013, following consultation with industry to clarify the requirements for mitigating combustible wood dust hazards. BCSA began follow up at sawmills throughout the province, in fall of 2013. Follow up on the safety order will continue throughout 2014.

The Electrical Technology Advisory Committee met four times in 2013, and has established the need for three working groups to address the following technical safety and service delivery issues:

- defining requirements for the recognition of an electrical training program by the provincial safety manager;
- lockout procedures for maximizing worker safety; and,
- review of Electrical Safety Regulation section 18 (permit requirements for electrical work).

The electrical safety managers of the Safety Standards Administrators' Group met three times in 2013. The administrators' group is improving consistency among authorities having jurisdiction through three working groups:

- sharing of incident reports among all jurisdictions;
- sharing of information on contractor performance, and enforcement information; and,
- cross-jurisdictional notification of applications for building, electrical and gas permits.

Tech Talks

BCSA conducted 14 electrical Tech Talks throughout the province in 2013, covering four topics and reaching 570 stakeholders. More details of each Tech Talk can be found in Appendix E.

TABLE 2-3: Electrical Tech Talks Conducted in 2013

TOPIC	QTY. OF PARTICIPANTS IN 2013	REFERENCE: QTY. OF PARTICIPANTS IN 2012
2012 Electrical Code Changes	208	2,393
Arc Flash	160	175
Certification Requirements for Manufactured Homes and RV's	192	0
Generators	10	16

In addition, a series of 34 short videos were created covering key topics from the 2012 Electrical Code Changes Tech Talk. The videos have been viewed 5585 times, and have achieved a 93% play rate among viewers.

Media Relations

BCSA took the following media relations actions in 2013 related to electrical safety. A listing of all media relations can be found in Appendix F.

TABLE 2-4: Electrical Media Relations

ACTIONS	DESCRIPTION
Media release and media interview	BCSA released a recommendations report on its investigation into the January 20, 2012 explosion and fire at Babine Forest Products near Burns Lake BC. While the release did not specify any technology, some recommendations were towards the Canadian Electrical Code and there were links to two safety orders affecting electrical equipment.
Media release	Sent to trade publications to inform clients/industry about enforcement activities. In 2012, BCSA took 129 enforcement actions against contractors, equipment owners and others doing work in BCSA-regulated technology sectors for failing to comply with safety requirements and unlawfully performing regulated work.
Statement	BCSA provided an update on the status of recognition of training programs administered by the Applied Science Technologists and Technicians of BC (ASTTBC). After the initial review of ASTTBC's application, the provincial safety manager was satisfied that all electrical safety aspects of this limited scope work would be sufficiently covered under the proposed program and approval was granted subject to some conditions.
Statement	BCSA completed its investigation into the April 23, 2012 explosion and fire at Lakeland Mills in Prince George BC. The investigation results are not being released at this time to avoid compromising Crown Counsel's review of a referral from WorkSafeBC.
Statement	BCSA issued a statement to clarify its decision not to release the full Babine investigation report to avoid compromising Crown Counsel's review of a referral from WorkSafeBC.
Media release	BCSA released safety tips to the central interior and northern regions where flooding was expected. BCSA reminds homeowners and businesses to take precautions with gas and electrical appliances when flooding is expected.
Article submission	A BCSA electrical safety officer submitted an article to Connector, the BC Electrical Association newsletter, to emphasize how counterfeit electrical products negatively affect the electrical industry in British Columbia, and to provide contractors with the tools to identify and avoid counterfeit products.
Media interview	BCSA's president & CEO provided comment and context for a Canadian Home Builders Association (CHBA) BC Homes Magazine story on professionalism in the construction industry.
Media release and media interview	In response to flooding in the Kootenays and Central Interior, BCSA issued safety information about post-flood safety. BCSA's director for operations & service excellence also provided comment and context during a radio interview on this topic.
Media interview	BCSA's director for technical programs provided comment and context during a radio interview about the safety order: Combustible Dust Hazard in Wood Processing Facilities.

TABLE 2-4: Electrical Media Relations Cont'd

ACTIONS	DESCRIPTION
Media interview	BCSA's leader for communications & media relations provided comment and context during an interview with a trade publication regarding BCSA's decision not to release the full Babine and Lakeland investigation report to avoid compromising Crown Counsel's review of a referral from WorkSafeBC.
Media release	Sent to trade publications to inform clients/industry about enforcement activities. BCSA took 48 enforcement actions against contractors, equipment owners and others doing work or using regulated equipment in BCSA-regulated technologies in the first half of 2013.
Media interview	BCSA's leader for communications & media relations provided comment and context during a media interview regarding BCSA's investigation into a fatal explosion at a legal grow operation.
Media release and media interview	BCSA released a call for nominations for the Lieutenant Governor Safety Awards 2013. BCSA's President & CEO also provided comment and context during a radio interview on this topic.
Media interview	BCSA's electrical safety manager provided an update, comment and context on the status of recognition of training programs administered by the Applied Science Technologists and Technicians of BC (ASTTBC).
Media release	BCSA's president & CEO provided the Educational Facilities Managers Association of BC – Ops Talk with an article on risk managing complex technical systems.
Media interview	A BCSA communications officer provided context during a media interview about safety issues and BCSA actions affecting a home park.
Media release	BCSA released information regarding the recipients of BCSA's Lieutenant Governor Safety Award.
Media release	BCSA announced that the recipients of BCSA's Lieutenant Governor Safety Award will be honoured in an awards ceremony.
Media interview	A BCSA communications officer clarified that static electricity is covered by the Fire Code and is best addressed by the Office of the Fire Commissioner.

Licensing and Certification

BCSA requires that electrical equipment is installed, operated and maintained by qualified and knowledgeable professionals. In 2013, 348 new contractor licences and 604 certificates of qualification were issued.

TABLE 2-5: New Electrical Licences and Certificates of Qualification Issued

TYPE	DOCUMENT	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Licence	Contractor Licence	348	397
Certificate of Qualification	Field Safety Representative, Class A	58	62
	Field Safety Representative, Class B	291	19
	Field Safety Representative, Class C	2	3
	Field Safety Representative, Full Entertainment	6	7
	Field Safety Representative, Low Energy Systems	24	43
	Field Safety Representative, Power Line Technician	1	3
	Field Safety Representative, Refrigeration Mechanic	185	57
	Field Safety Representative, Security Alarms Installer	13	27
	Field Safety Representative, Solar Photovoltaic Systems	1	1
	Field Safety Representative, Underground Raceway Installer	22	28
	FSR Instrument Mechanic	1	0

Enforcement Actions

In 2013, 15 compliance orders and six sanctions were issued in the electrical sector. Details of each action taken are included in Appendices B1 and B2.

TABLE 2-6: Electrical Enforcement Actions Taken

ACTION	CATEGORY	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Compliance Order	No contractor's licence	6	6
	Use of unqualified workers	3	5
	No permit	2	17
	Outstanding non-compliance(s)	2	12
	No valid BC certificate of qualifications	1	15
	Sale of uncertified equipment	1	2
Sanctions	Failure to comply with a compliance order	4	0
	Failure to comply with terms and conditions on a licence	1	0
	Failure to comply with SSGR s.12	1	0

Regulatory Instruments and Amendments

BCSA issues safety orders, directives and information bulletins to stop unsafe activity and provide clarification of regulatory requirements and interpretations. Additional details can be found in Appendix C or at www.safetyauthority.ca.

TABLE 2-7: Electrical Regulatory Instruments Issued

TYPE	DOC NO.	TITLE/DESCRIPTION
Safety Order	SO-EL/GA 2013-02	Combustible Dust in Wood Processing Facilities (issued jointly with gas technology)
Directive	D-EL 2013-01 BC	Electrical Code Section 2
Bulletin	IB-EL 2013-01 BC	Electrical Code -Section 2, Requirement To De-Energize Electrical Equipment
Bulletin	B-E3 071019 3	Revision 4 Approved Certification Marks for Electrical Products
Bulletin	IB-EL 2013-02	New Permit Category: Extra Low Voltage/Low Energy Decals
Bulletin	IB-A1 2013-01	Changes To IT System And Online Permits Purchasing (issued jointly with gas technology)
Bulletin	IB-A1 2013-02 Revision 1	Changes To Access Dates For Online Services (issued jointly with gas technology)
Bulletin	IB-A1-2013-03	Client Documents Delayed (issued to all technologies)

Safety Manager's Discussion

Implementation of BCSA's new IT system for permit issuance, inspections and follow up on safety order SO-EL-GA-2013-02 impacted physical assessments of electrical installation work in 2013. However, BCSA continued to focus its attention on areas of higher risk. BCSA safety officers performed physical inspections for 90% of requests that were deemed to be high priority as established by our risk-informed Resource Allocation Program. Safety officers also investigated over 850 potential electrical hazards, and work suspected of having been performed without permits in 2013.

The 2012 explosions and fires at four wood processing facilities in BC resulted in fatalities and serious injuries to workers. Safety order SO-EL-GA-2013-02 was issued following the investigation conclusions and recommendations aiming to reduce the risk of fire or explosion related to regulated electrical equipment as a potential combustion or ignition source in wood processing operations. We continued to increase our focus on electrical risks at wood processing facilities in 2013.

Implementation of the new IT database system for permits and inspections will enhance BCSA's ability to collect information on electrical safety performance by installers and electrical equipment owners. In 2013, we continued to advance our understanding of hazards found during inspections. Training for safety officers included enhancements to how safety officers assess and document hazards created by non-compliances found during physical assessments. Improvements to how information is entered into the database will result in Certificates of Inspection that provide improved descriptions of conditions found by safety officers during their physical assessments of electrical installations.

BCSA recognized concerns expressed by industry stakeholders and the Electrical Technology Advisory Committee about hazards related to work on energized electrical equipment. A directive and information bulletin on requirements to de-energize electrical equipment were issued in 2013 to clarify these requirements. Industry stakeholders also expressed concerns about poorly trained and unqualified workers who perform electrical work. This item was added to the Electrical Technology Risk Register as a high risk item. BCSA will continue to work with the Electrical Technology Advisory Committee to develop mitigation strategies and programs to address this issue.

The Applied Science Technologists and Technicians of British Columbia (ASTTBC) completed development of its training programs for Class EL1 and EL2 Electrical Work Practitioners in October 2013. Their final submission was reviewed and accepted as a recognized training program on October 29, 2013. Recognition of the program means that ASTTBC will now be able to implement its processes and procedures for registered ASTTBC technologists and technicians to be trained to perform electrical work, within the scope of their credentials as technologists or technicians, and become certified as having completed training.

Completion of this training program will allow them to be eligible to apply for a BCSA credential to perform a restricted scope of electrical work within specialized fields. Individuals who obtain a BCSA credential under a recognized training program will not be granted broad certification as electrical workers, and will not be a replacement for electrical workers who have obtained credentials issued under existing training programs, such as the electrical Red Seal program. However, this program will promote safety through additional training for those technologists and technicians whose work normally includes interaction with, or performance of work on electrical equipment.

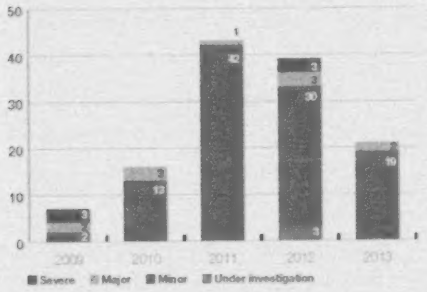
Under the terms and conditions for approval, ASTTBC will be required to continue consulting with industry stakeholders to identify opportunities for continued program enhancement. ASTTBC will also be required to conduct education programs for employers of technologists and technicians to promote improved understanding on the scope and restrictions for performance of electrical work by technologists and technicians. This program supports calls from various industry sectors for improvement of training for technical and skilled workers. We continue to encourage industry stakeholders to participate in our ongoing efforts to promote the enhancement of safety.

Ulrich Janisch
Electrical Safety Manager

Understanding Boilers, Pressure Vessels and Refrigeration Safety Risks

In the Boilers, Pressure Vessels and Refrigeration (BPVR) Safety Program at BCSA, we are responsible for overseeing the design, construction, installation and operation of boilers, pressure vessels and refrigeration plants throughout BC in accordance with the *Safety Standards Act* and the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation.

FIGURE 3-1:
BPVR Incident Reports 2009-2013



Incidents

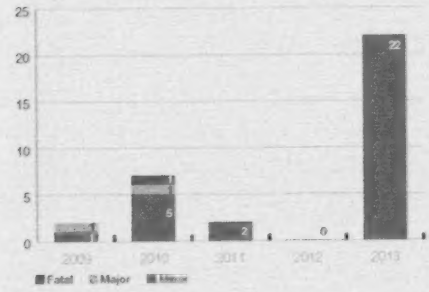
The following summarizes incidents reported to BCSA involving regulated boilers, pressure vessels and/or refrigeration (BPVR) equipment.

TABLE 3-1: BPVR Major Incidents in 2013

RATING	QTY.	DESCRIPTION
Major	2	Equipment failure (tubes ruptured)

In 2013, there were two *MAJOR* incidents reported to BCSA. *MINOR* incidents consisted of component failures and refrigerant leaks, such as ammonia. A summary of incidents is included in Appendix A.

FIGURE 3-2:
BPVR Injuries Reported 2009-2013



Injuries

Injuries reported as a result of boiler, pressure vessel and refrigeration incidents are summarized below.

In 2013, two incidents resulted in 22 *MINOR* injuries. In one incident, 19 people received minor injuries when ammonia was released into the atmosphere; and in the other incident, three people were treated for smoke inhalation when the contents of a pressure vessel ignited.

Assessments of Regulated Work

BPVR safety officers assess new installations as well as operating equipment as part of regular maintenance. Non-compliances are communicated to equipment operators by Certificates of Inspection when work is assessed as not conforming to the applicable regulation.

FIGURE 3-3: BPVR Installation Permits

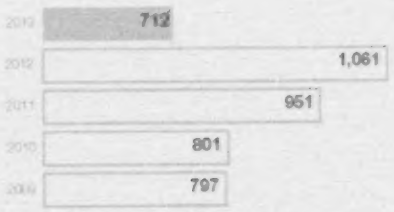


FIGURE 3-4: BPVR Operating Permits

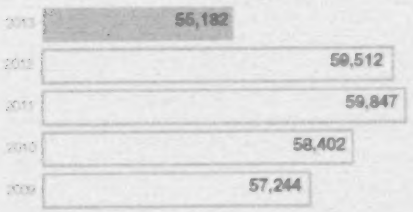


FIGURE 3-5: BPVR Physical Assessments

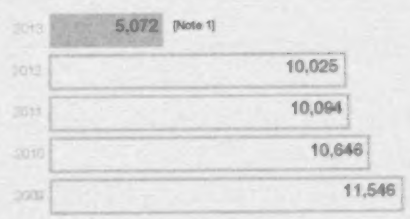


FIGURE 3-6: BPVR Rejected Units [Note 1]

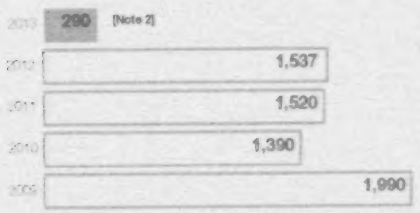


Fig 3-5 Note 1: See management discussion on page 9 for interpretation of reduced physical assessments in 2013.
Fig 3-6 Note 1: The BPVR Safety Program records the number of rejected units resulting from physical assessments. A rejected unit may have one or more non-compliances that require correction.
Fig 3-6 Note 2: The 2013 row represents the number of rejected units resulting from physical assessments that occurred January 1, 2013 to April 14, 2013. Due to an enterprise-wide, production information system change, the record of non-compliance information has changed and will no longer be relatable to findings pre- April 15, 2013. Going forward, BCSA will establish a more consistent and meaningful measure of regulatory compliance and importantly, it is working to improve risk understanding by establishing a process for documenting hazards found during assessments of regulated work. For further information, see the management discussion on page 9.

The Boilers, Pressure Vessels and Refrigeration Safety Program conducts assessments on both newly installed boilers, pressure vessels and refrigeration plants as well as periodic assessments throughout the operating life of the equipment after it has passed its installation inspection. The periodic assessment schedule for operating pressure equipment is established through a resource allocation program which takes into consideration the type of equipment, its size, type of occupancy where it is installed and the last assessment date to determine what equipment is at increased risk. Higher risk equipment is scheduled for assessment and evaluation for safe operation. The number of physical assessments for 2013 is a total of both new installation and periodic operating assessments.

Managing Boilers, Pressure Vessels and Refrigeration Safety Risks

Stakeholder Engagement

The boiler technology consulted with industry stakeholders to finalize a directive to provide interpretation and application of the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation with respect to the experience that a fourth class power engineer employed in a power plant could contribute towards qualifying for a third class power engineer certificate of qualification.

The boiler technology, in conjunction with the gas technology, consulted with owners and users of propane tanks to launch an initiative to administer the requirements for operating permits for this type of pressure vessel. This initiative will continue into 2014.

The Boiler, Pressure Vessel and Refrigeration Technology Advisory Committee met four times in 2013, and included working groups for the following technical safety and regulatory improvement opportunities:

- quality Control procedures for refrigeration contractors;
- maintenance of low pressure heating boilers;
- regulation review;
- firing time for the third class power engineer certificate of qualification; and
- Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation review.

Media Relations

BCSA took the following media relations actions in 2013 related to BPVR safety. A listing of all media relations can be found in Appendix F.

TABLE 3-2: BPVR Media Relations

ACTIONS	DESCRIPTION
Media release	Sent to trade publications to inform clients/industry about enforcement activities. In 2012, BCSA took 129 enforcement actions against contractors, equipment owners and others doing work in BCSA-regulated industry sectors for failing to comply with safety requirements and unlawfully performing regulated work.
Media interview	BCSA's president & CEO provided comment and context for a Canadian Home Builders Association (CHBA) BC Homes Magazine story on professionalism in the construction industry.
Media release	Sent to trade publications to inform clients/industry about enforcement activities. BCSA took 48 enforcement actions against contractors, equipment owners and others doing work or using regulated equipment in BCSA-regulated technologies in the first half of 2013.
Media release and media interview	BCSA released a call for nominations for the Lieutenant Governor Safety Awards 2013. BCSA's president & CEO also provided comment and context during a radio interview on this topic.
Media release	BCSA's president & CEO provided the Educational Facilities Managers Association of BC – Ops Talk with an article on risk managing complex technical systems.
Media release	BCSA released information regarding the recipients of BCSA's Lieutenant Governor Safety Award.
Media release	BCSA announced that the recipients of BCSA's Lieutenant Governor Safety Award will be honoured in an awards ceremony.
Media interview	A BCSA regional business leader provided comment and context during a media interview about safety oversight for ice rinks and an update on the investigation of a 2011 ammonia leak incident. Prior to the interview, BCSA's BPVR safety manager explained the process that could lead to an ammonia leak.

Licensing and Certification

BCSA verifies that BPVR equipment is installed, operated and maintained by qualified and knowledgeable professionals. In 2013, 73 new contractor licences and 883 certificates of qualification were issued to individuals that demonstrated the required capabilities to produce safe work.

TABLE 3-3: New BPVR Licences and Certificates of Qualification Issued

TYPE	DOCUMENT	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Licence	Contractor Licence	73	113
Certificate of Qualification	1st Class Power Engineer	7	10
	2nd Class Power Engineer	45	0
	3rd Class Power Engineer	106	119
	4th Class Power Engineer	312	308
	5th Class Power Engineer	40	38
	Ice Facility Operator	82	61
	Refrigeration Operator	55	49
	Boiler Safety Awareness	26	51
	Refrigeration Safety Awareness	100	69
	Antique Show Boiler Operator – Traction Engine	2	0
	Oilwell Boiler Operator	108	0

Enforcement Actions

In 2013, eight compliance orders were issued, details of which are contained in Appendix B1.

TABLE 3-4: BPVR Enforcement Actions

ACTION	CATEGORY	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Compliance Order	No permit	3	0
	No contractor's licence	2	0
	No valid BC certificate of qualifications	1	0
	Outstanding non-compliance	1	1
	Incorrect permit	1	0

Regulatory Instruments and Amendments

An amendment was made to the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation that adopted the latest editions of several codes. New editions of codes help ensure that BC manufacturers remain competitive through taking advantage of the latest developments in technology. BCSA issues safety orders, directives and information bulletins to stop unsafe activity and provide clarification of regulatory requirements and interpretations. Additional details can be found in Appendix C or at www.safetyauthority.ca.

TABLE 3-5: BPVR Regulatory Instruments Issued

TYPE	DOC NO.	TITLE/DESCRIPTION
Directive	D-BP- 2013-01 Revision 1	Registration and permit requirements for boilers in heating plants
Directive	D-BP 2013-02	Determining the capacity of refrigeration systems
Directive	D-BP 2013-03	Exemption from registration requirements for category A, B, C, and G category fittings
Bulletin	IB-BP-2013-01	Design registration – Changes to BC Safety Authority's application forms for reciprocal registrations
Bulletin	IB-BP 2013-02	Recommended maintenance and inspection for low pressure steam boilers not exceeding 30 m3
Amendment	N/A	Adoption of new editions of boiler codes

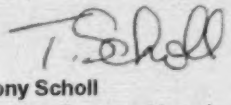
Safety Manager's Discussion

There was a significant drop in the number of incidents reported in the Boiler, Pressure Vessel and Refrigeration Safety Program from 39 in 2012 to a total of 21 in 2013. All injuries reported in 2013 were considered to be minor, with a total of 19 minor injuries being attributed to a single incident related to an outdoor ammonia refrigerant release at an industrial plant.

This incident substantiates the safety risks associated with the release of ammonia refrigerant, including those to the outdoors, and also confirms the importance of continuing to focus efforts on prevention. The assessment of refrigeration plants located in ice arenas and other industrial facilities continues to be a priority for safety officers.

The Boilers, Pressure Vessels and Refrigeration Safety Program continues to receive the cooperation of owners and users of pressure equipment in the oil and gas sector to provide BCSA with pressure equipment data. This continued cooperation between BCSA and the propane industry to administer the requirements for operating permits of propane pressure vessel, will result in increased BCSA knowledge of existing pressure equipment in BC.

The BPVR program will continue to provide valued services to our clients and to advance the understanding of safety risks. This will be accomplished in part through the knowledge of existing equipment and understanding the level of safety risks associated with pressure equipment. Together, a focus of efforts between BCSA and stakeholders will support the goal to shift from correction to the prevention of safety risks.



Tony Scholl
Boilers, Pressure Vessels and Refrigeration Safety Manager

Understanding Gas Safety Risks

In the Gas Safety Program at BCSA, we are responsible for overseeing industrial and commercial use of natural gas, propane, digester gas, manufactured gas, liquefied petroleum gas, landfill gas and hydrogen throughout BC in accordance with the *Safety Standards Act* and the Gas Safety Regulation. We are responsible for delivering gas safety services for approximately 1.2 million homes in the province. Municipalities that have separate administrative agreements with the province to oversee low pressure gas systems and work are identified in Appendix H.

FIGURE 4-1:
Gas Incident Reports 2009-2013

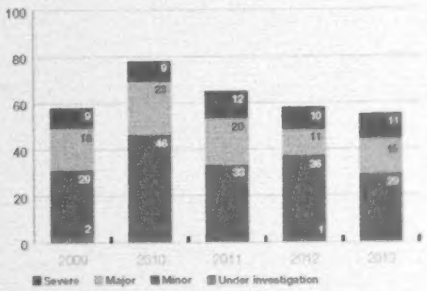
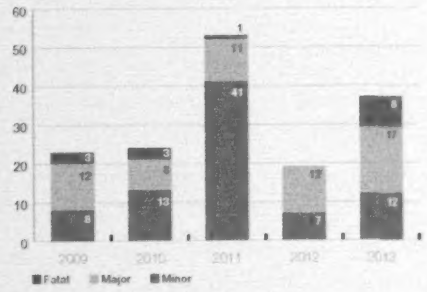


FIGURE 4-2:
Injuries Reported 2009-2013



Incidents

The following summarizes incidents reported to BCSA involving regulated gas equipment.

TABLE 4-1: Severe and Major Gas Incidents in 2013

RATING	QTY.	DESCRIPTION
Severe	7	Explosions and/or fires where gas equipment was involved or suspected to be involved
	4	Carbon monoxide hazards
Major	10	Explosions and/or fires where gas equipment was involved or suspected to be involved
	4	Carbon monoxide hazards
	1	Gas odour reported/gas leak

There were no significant changes to the number and type of incidents reported to BCSA in 2013 compared to previous years. Most *MINOR* incidents were related to fires involving gas equipment, elevated carbon monoxide and gas leaks. A summary of closed incidents is included in Appendix A.

Injuries

Injuries reported as a result of gas incidents in 2013 are summarized below.

TABLE 4-2: Fatal and Major Injuries Reported in 2013

RATING	QTY.	DESCRIPTION
Fatal	4	Fatalities from fires and/or explosions where gas equipment was involved or suspected to be involved
	4	Fatal carbon monoxide poisoning
Major	15	Carbon monoxide poisoning/exposure
	2	Burns, loss of consciousness

Three explosions (and subsequent fires) resulted in four fatalities and *MAJOR* injuries to two individuals (life threatening burns, loss of consciousness). Four fatalities and 15 *MAJOR* injuries were attributed to carbon monoxide incidents occurring at residences.

Given the persistent number of incidents and injuries related to carbon monoxide exposure as well as to supplement BCSA's ongoing campaign for carbon monoxide awareness, this year's annual state of safety report includes a summary of the previous six years of carbon monoxide incidents and injuries reported to BCSA.

Assessments of Regulated Work

Gas safety officers assess new installations as well as operating equipment as part of regular maintenance. Non-compliances are recorded when work does not conform to the applicable regulation.

FIGURE 4-3: Gas Installation Permits

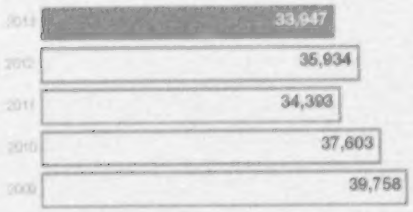


FIGURE 4-4: Gas Operating Permits

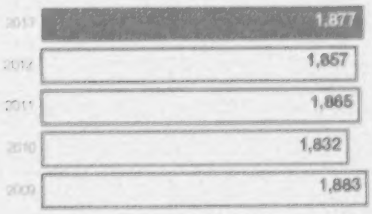


FIGURE 4-5: Gas Physical Assessments

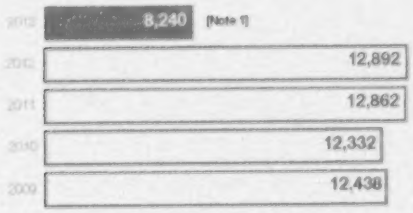


FIGURE 4-6: Gas Non-Compliant Assessments

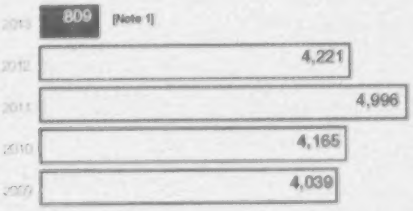


Fig 4-5 Note 1: See management discussion on page 9 for interpretation of reduced physical assessments in 2013.
Fig 4-6 Note 1: The 2013 row represents non-compliant assessments recorded from January 1, 2013 to April 14, 2013. Due to an enterprise-wide, production information system change, the record of non-compliance information has changed and will no longer be relatable to findings pre- April 15, 2013. Going forward, BCSA will establish a more consistent and meaningful measure of regulatory compliance and importantly, it is working to improve risk understanding by establishing a process for documenting hazards found during assessments of regulated work. For further information, see the management discussion on page 9.

For assessments, our Resource Allocation Program (RAP) provides a first level filtering of installation permit factors. RAP considers factors such as past history of compliance, scope of gas work, type of equipment installed, type of occupancy, and the period since the last assessment was conducted. This provides a guide to gas safety officers regarding the prioritization of physical assessments. With the integration of the new "as found conditions" tactic, when a physical assessment is performed, this will provide a snapshot of the possible consequences of having non-compliances unidentified and uncorrected. Reports will be generated and audited to determine if further refinement is needed to best determine where to deploy resources in the most effective and efficient manner. Expansion of RAP will be explored to determine if it can be utilized in other areas of the technology. In addition to RAP, we continue to monitor non-compliance trends from recorded assessment reports and develop mitigation plans where required to drive for an improved change.

Carbon Monoxide Incidents (2007 to 2012)

Carbon monoxide (CO) is a poisonous gas that is colorless, odorless and tasteless. If inhaled in sufficient quantities, CO can interfere with the body's ability to absorb oxygen. At low concentrations, CO poisoning symptoms present similar to flu symptoms: headaches, nausea, fatigue and dizziness. In higher concentrations or prolonged exposure, symptoms can worsen and cause loss of consciousness and death.

Carbon monoxide exists naturally in the atmosphere in small concentrations and is also a combustion by-product of carbon-based fuels. CO is produced when the combustion of a carbon-based fuel is incomplete, usually due to insufficient oxygen during the combustion process. Balanced fuel and air mixtures can minimize the amount of CO produced during combustion while venting combustion gasses to the atmosphere prevents CO build-up from occurring in enclosed spaces.

FIGURE CO-1:
Basic combustion diagram

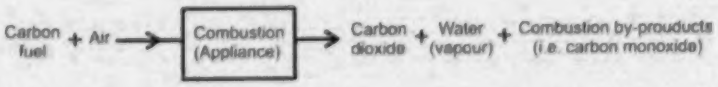
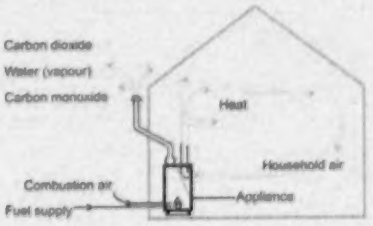


FIGURE CO-2:
Basic illustration of a residential appliance



Over the years, BCSA observed incidents involving regulated equipment that resulted in CO poisoning fatalities and other non-fatal injuries. CO poisoning incidents are usually a result of the following two conditions being present:

1. A failure to effectively vent the products of combustion away from enclosed, occupied spaces; and/or,
2. Excess CO being produced by fuel burning appliances.

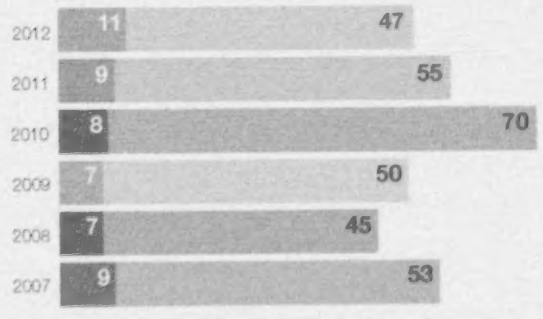
This case study provides an overview of the incidents involving CO that were reported to and investigated by safety officers occurring from January 1, 2007 to December 31, 2012.

It is important to note that BCSA does not regulate all fuels that produce CO, therefore occurrences involving fuels not regulated by BCSA are not considered in this review.

Investigations by BCSA

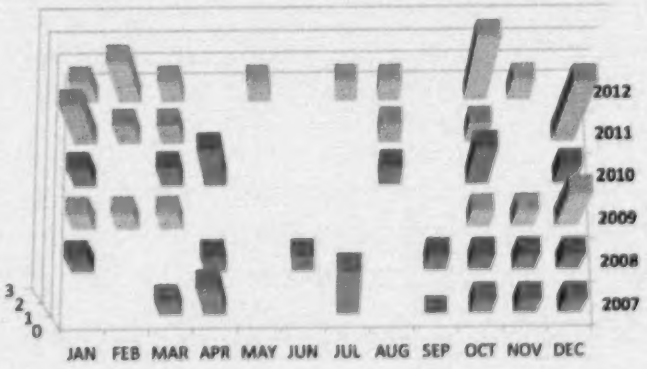
A total of 51 incidents were reported and investigated between 2007 and 2012. These incidents resulted in five fatalities and 92 non-fatal injuries. A listing of the incidents is included in Table A-3-1: Listing of Carbon Monoxide Incident Investigations 2007-2012 (Appendix A).

FIGURE CO-3:
Incidents investigated by gas safety officers



Note: The dark colour represents CO incidents, and the lighter colour indicates other gas incident investigations

FIGURE CO-4:
Carbon monoxide incidents investigated by month and year



There is little variation in the number of CO incident investigations from 2007 to 2012. CO incident investigations represent 51 of the 371 gas related incidents investigated by BCSA safety officers. Figure CO-4 shows the distribution of CO incident investigations by month and illustrates that most of the CO-related incidents occurred from October to April, during the cooler months of the year.

During this six-year period, CO incidents resulted in five fatalities and 92 non-fatal injuries. In June 2008, one incident resulted in 27 employees at an industrial facility where the investigation stated the employees were taken to hospital and found to have CO poisoning.

Most incidents occurred in residences and involved residential furnaces or water heaters. Each investigation identified at least one appliance that produced, or may have produced, CO.

FIGURE CO-5: [Note 1]
Injuries resulting from CO incident investigations

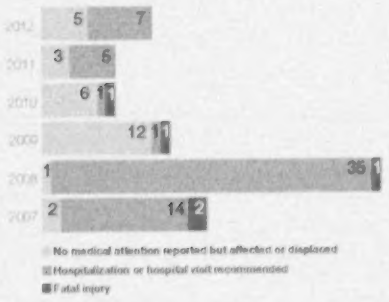


Fig CO-5 Note 1: The categorization of the non-fatal injuries in Figure CO-5 differs from the categorization used in the remainder of the State of Safety Report (i.e., CO injuries are usually classified as 'major injuries').

FIGURE CO-6: Structures where CO incidents occurred

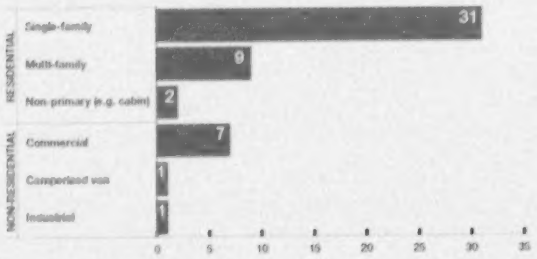


FIGURE CO-7: Sources of carbon monoxide [Note 1]

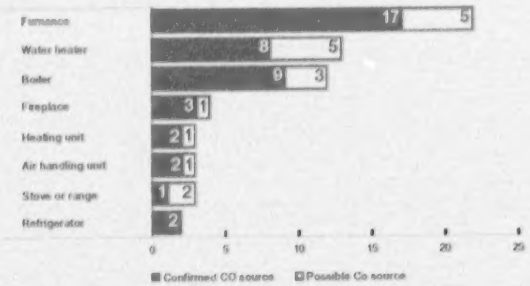


Fig. CO-7 Note 1: Some investigations identified multiple appliances that may have produced CO, yet did not confirm which was most likely the CO source; therefore the total number of appliances exceeds the number of events. For example, there were 23 incidents that identified furnaces for potential involvement. In 17 of these 23 cases, the investigation confirmed that the furnace was the source of excess CO. In the remaining five cases, the investigation could not confirm that the furnace produced excess CO, or the investigation identified that there were other appliances (in addition to the furnace) that could have produced excess CO.

Investigation activities focus on understanding the relationship between regulated work or regulated equipment and the factors that may have contributed to the cause of the event. Factors contributing to the CO incident occurrences are summarized in Table CO-1 below. Additional details are available in Table A-3-1 (Appendix A).

TABLE CO-1: Summary of Factors Contributing to CO incidents

QTY. OF EVENTS	CAUSES AND CONTRIBUTING FACTORS THAT ATTRIBUTED TO THE INCIDENT
18	Ventilation and inability to vent combustion products
9	Service, maintenance and/or equipment replacement
8	Equipment or component failures
5	Installation issues
5	Investigations were inconclusive [Note 1]
3	Unqualified persons performing regulated work
1	Poor air-gas ratio
1	Unsafe use of equipment
1	Wind creating a downdraft

Note 1: Although elevated CO was observed, the investigation was either unable to determine the cause or unable to rule out the involvement of regulated equipment.

This case study provides a general overview of the CO-related incidents reported to and investigated by BCSA. From 2007 to 2012, there were 51 incidents resulting in five fatalities and 92 non-fatal injuries. Most CO incidents occurred during October to April. Most incidents occurred in residences and involved residential furnaces or water heaters as the source of CO while ineffective venting and maintenance were identified as the most prevalent contributing factors.

This case study highlights the importance of proper installation and maintenance of residential fuel burning appliances and their venting systems. It also illustrates the importance of using CO detectors in homes that incorporate fuel burning appliances. In 2011, BCSA launched an initiative focused on generating awareness around the hazards associated with CO poisoning and how to reduce those hazards and prevent future incidents. This awareness campaign, called Be in the Know About CO, continued through 2012 and into 2013. More information on these CO public awareness initiatives can be found in the following section, Managing Gas Safety Risks, and on our website at: http://www.safetyauthority.ca/be-in-the-know.

Managing Gas Safety Risks

Stakeholder Engagement

In support of recommendations following the catastrophic incident at Babine Forest Products in January 2012, BCSA drafted a safety order regarding identifying combustible dust hazards in wood processing facilities containing electrical or gas equipment. The draft safety order was distributed to the wood processing industry to gain feedback on the feasibility of implementing the requirements within the proposed timeframe. Based on the feedback received, the final safety order was rewritten with clearer definitions of "wood processing facility" and "qualified professional", specifications on how to safely operate the equipment, and requirements for periodic re-assessment.

The Gas Technology Advisory Committee met four times in 2013, and established the need for five working groups to address the following regulatory improvement, technical safety and service delivery issues:

- review requirements for obtaining a gas contractor licence;
- apprenticeship review in preparation for red seal for gasfitters;
- Gas Safety Regulation review;
- review of directive on small utilities; and
- gasfitter bursary requirements.

The gas safety managers of the Safety Standards Administrators' Group met twice in 2013. The administrators' group is improving consistency among authorities having jurisdiction through three working groups, focused on the following topics:

- sharing of incident reports among all jurisdictions;
- poorly performing contractors and enforcement information sharing among all jurisdictions; and
- cross-jurisdictional notification of applications for building, electrical and gas permits.

Education

BCSA continued its outreach program called Be in the Know About CO, focused on generating awareness of the hazards and causes of carbon monoxide poisoning in BC. More information about this program can be found at: http://www.safetyauthority.ca/carbon-monoxide.

BCSA conducted seven Tech Talks throughout the province in 2013, covering two topics and reaching 92 stakeholders. More details of each Tech Talk can be found in Appendix E.

TABLE 4-3: Gas Tech Talks Conducted

TITLE/TOPIC	QTY. OF PARTICIPANTS IN 2013	REFERENCE: QTY. OF PARTICIPANTS IN
Introduction to BCSA	54	0
Understanding Enforcement and the Top 5 Non-Compliances	8	0

Media Relations

BCSA took the following media relations actions in 2013 related to gas safety. A listing of all media relations can be found in Appendix F.

TABLE 4-4: Gas Media Relations

ACTION	DESCRIPTION
Media release	Sent to trade publications to inform clients/industry about enforcement activities. In 2012, BCSA took 129 enforcement actions against contractors, equipment owners and others doing work in BCSA-regulated industry sectors for failing to comply with safety requirements and unlawfully performing regulated work.
Media release	BCSA released safety tips prior to the Victoria Day long weekend ranging from carbon monoxide information to the proper use of gas equipment on RVs.
Media release	BCSA released safety tips to the central interior and northern regions where flooding was expected. BCSA reminds homeowners and businesses to take precautions with gas and electrical appliances when flooding is expected.
Media interview	BCSA's president & CEO provided comment and context for a Canadian Home Builders Association (CHBA) BC Homes Magazine story on professionalism in the construction industry.
Media release and media interview	In response to flooding in the Kootenays and Central Interior, BCSA issued safety information about post-flood safety. BCSA's director for operations & service excellence also provided comment and context during a radio interview on this topic.
Media release and media interview	BCSA released safety tips prior to the Canada Day long weekend ranging from carbon monoxide information to the proper use of gas equipment on RVs.
Media release	A BCSA communications officer provided propane safety tips for Chevron's Burnaby Refinery Neighbourhood News.
Media release	Sent to trade publications to inform clients/industry about enforcement activities. BCSA took 48 enforcement actions against contractors, equipment owners and others doing work or using regulated equipment in BCSA-regulated technologies in the first half of 2013.
Media interview	BCSA's leader for communications & media relations provided comment and context during a media interview regarding BCSA's investigation into a fatal explosion at a legal grow operations.
Media release and media interview	BCSA released a call for nominations for the Lieutenant Governor Safety Awards 2013. BCSA's president & CEO also provided comment and context during a radio interview on this topic.
Media interview	A BCSA gas safety officer provided tips on how to keep gas appliances safe in a media interview as part of a story on ShakeOut BC.

TABLE 4-4: Gas Media Relations Cont'd

ACTION	DESCRIPTION
Media release and media interview	BCSA released a warning regarding uncertified trailers. BCSA's gas safety manager and senior gas safety officer also provided comment and context for several media interviews regarding this topic.
Media interview	A BCSA communications officer provided context during a media interview about work done by a contractor. The interview was triggered by concerns raised by a homeowner.
Media release	BCSA's president & CEO provided the Educational Facilities Managers Association of BC – Ops Talk with an article on risk managing complex technical systems.
Media release	BCSA released information regarding the recipients of BCSAs Lieutenant Governor Safety Award.
Media release	BCSA announced that the recipients of BCSA's Lieutenant Governor Safety Award will be honoured in an awards ceremony.
Media release and media interview	BCSA released safety tips to manage risks involving carbon monoxide in preparation for the winter season. BCSA's gas safety manager provided comment and context during a media interview on this topic.

Licensing and Certification

BCSA requires that gas equipment is installed, operated and maintained by qualified and knowledgeable professionals. In 2013, 260 new contractor licences and 772 certificates of qualification were issued.

TABLE 4-5: New Gas Licences and Certificates of Qualification Issued

TYPE	DOCUMENT	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Licence	Contractor Licence	260	305
Certificate of Qualification	Class A Gas Fitter	62	74
	Class B Gas Fitter	211	318
	Class B Gas Fitter – GP	376	616
	CNG Automotive Technician	26	27
	CNG/LPG Automotive Technician	2	11
	Gas Appliance Service Technician	53	61
	LPG Automotive Technician	5	16
	Gas Utility Technician	10	37
	RV Gas Installation & Service Technician	10	15
	Special Purpose Gas Certificate	17	40

Enforcement Actions

In 2013, 21 compliance orders and 7 sanctions were issued in the gas sector, details of each are included in Appendices B1 and B2.

TABLE 4-6: Gas Enforcement Actions

ACTION	CATEGORY	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Compliance Order	No permit	8	12
	No contractor's licence	4	4
	Outstanding non-compliances	3	2
	Performing regulated work beyond scope of qualifications	2	1
	Use of unqualified workers	2	8
	Failure to take regulated safety precautions	1	2
	Provide records	1	0
Sanctions	Failure to comply with a compliance order, term and condition of a licence and performing regulated work without a permit	2	0
	Performing regulated work without the required permission	2	0
	Failure to comply with a compliance order	1	0
	Performing regulated work without the required certificate of qualification, permit or permission	1	0
	Failure to comply with a condition of a certificate of qualification (competency)	1	0

Regulatory Instruments and Amendments

BCSA issues safety orders, directives and information bulletins to stop unsafe activity and provide clarification of regulatory requirements and interpretations. Additional details can be found in Appendix C or at www.safetyauthority.ca.

TABLE 4-7: Gas Regulatory Instruments Issued

TYPE	DOC NO.	TITLE/DESCRIPTION
Safety Order	SO-GA 2013-01	Installation Or Use Of Certified Gas Fire places Manufactured By Canadian Fire Hearth Manufacturing Inc. - Prohibited
Directive	D-GA 2103-01	Requirements For Installation Of Gas Meters On Customer-Owned Piping Systems
Directive	D-G5 090213 1 Revision 1	PropressG and MegapressG Press Connect Fittings For Natural / Propane Gas Systems
Bulletin	IB-GA 2013-01	Pipe Sizing And Pressure Drop Requirements
Bulletin	B-G5 051206 4 Revision 1	Clearance To Regulator/Meter Set Relief Device
Bulletin	IB-GA 2013-02	Portable Appliance and Fan Equipment Effects on Buildings
Bulletin	IB-GA 2013-03	Hazardous Location Requirements – Gas Equipment Installations

Safety Manager's Discussion

Although assessments are an important part of the safety system, in 2013 we shared learning experiences regarding the top five major non-compliances recorded against gas installations through informational Tech Talks in order to prevent ongoing patterns and reduce risk. An information bulletin was published as the result of a carbon monoxide incident related to the use of portable fan equipment and the potential depressurization effects that they may have on living spaces depending on size, application and building tightness. Depressurization of buildings that involve fuel burning equipment can lead to the products of combustion spilling into the living space.

Work continues toward establishing gasfitting as a designated "Red Seal" trade. The recognition of gasfitting as a trade separate from traditional piping trades qualifications (e.g., plumbing, steamfitting) will allow a more focused approach to training, and provide the consistency of qualifications currently enjoyed by other Red Seal trades. With this evolution, the gas program will begin to model with stakeholders the development of a Field Service Representative (FSR) designation for gasfitting to provide the level of safety oversight appropriate to the industry.

Information sharing and exchange with other regulators within Canada continues, along with our contributions to various national technical committees and subcommittees. Work continues through various technical committees on development and ballot voting for the 2015 versions of the B149 series of provincially adopted standards, final drafts to be completed in 2014.

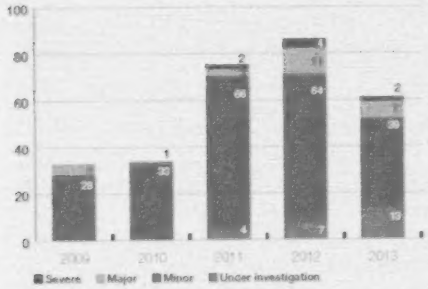
The use of compressed natural gas for vehicle fuel, and its storage as a liquid (LNG) continues to evolve, and is producing encouraging results for equipment suppliers and vehicle operators. In addition to the first permanent LNG fuelling site commissioned last year, we have seen additional satellite dispensing sites located through out the province in order to facilitate heavy vehicle transport of goods. LNG, along with other alternative fuels such as hydrogen, will continue to grow in use and application. We continue to work with our regulatory partners and committees for standards development in order to provide integrated technical safety oversight for these evolving gas industries.

Brian Zinn
Acting Gas Safety Manager

Understanding Elevating Devices Safety Risks

In the Elevating Devices (ED) Safety Program at BCSA, we are responsible for overseeing the safety of elevators, escalators, moving walkways, dumbwaiters, lifts and construction hoists in accordance with the Safety Standards Act and the Elevating Devices Safety Regulation.

FIGURE 5-1:
ED Incident Reports 2009-2013



Incidents

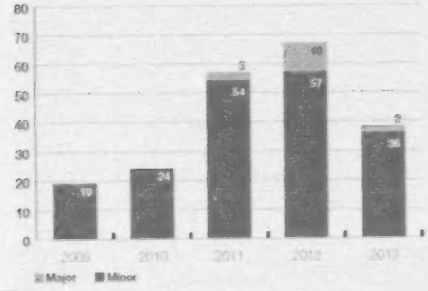
The following summarizes incidents reported to BCSA involving regulated elevating devices.

TABLE 5-1: Severe and Major ED Incidents in 20133

RATING	QTY.	DESCRIPTION
Severe	1	Control relay reset malfunctioned
	1	Light fixture fell from the elevator cab ceiling
Major	4	Trip and/or fall on/from escalator
	2	Elevator failure/malfunction
	1	Incorrect use of equipment (passenger took a grocery cart onto escalator)

The number of incidents reported to BCSA is generally inconsistent year over year. There were two *SEVERE* incidents reported in 2013 and seven *MAJOR* as indicated above. *MINOR* incidents were related to unintended contact with elevating devices (such as trips, falls and unintended door closures), and a passenger reported receiving an electrical shock from an elevator's car panel buttons. A summary of closed incidents is included in Appendix A.

FIGURE 5-2:
Injuries Reported 2009-2013



Injuries

Injuries reported as a result of elevating device incidents are summarized below.

TABLE 5-2: Major Injuries Reported in 2013

RATING	QTY.	DESCRIPTION
Major	1	Broken jaw and lacerations
	1	Injuries from approx 30 foot fall from escalator

There were fewer injuries reported in 2013 compared to previous years. *MINOR* injuries consisted of pain and lacerations resulting from contact with escalators and elevators and an electrical shock from an elevator's car panel buttons.

Assessments of Regulated Work

Elevating devices safety officers assess new installations as well as operating devices as part of regular maintenance. Non-compliances are recorded when the physical assessment of work determines that it does not conform to the applicable regulation.

FIGURE 5-3: ED Installation Permits

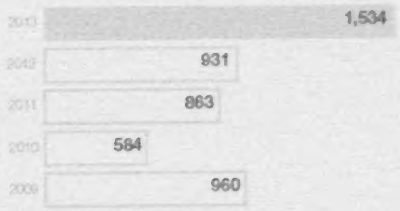


FIGURE 5-4: ED Operating Permits

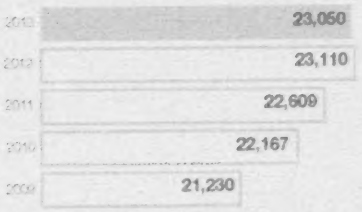


FIGURE 5-5: ED Physical Assessments

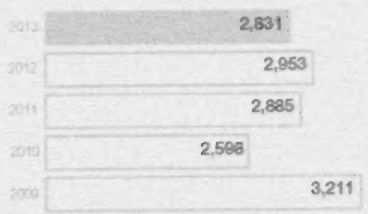


FIGURE 5-6: ED Non-Compliances Identified

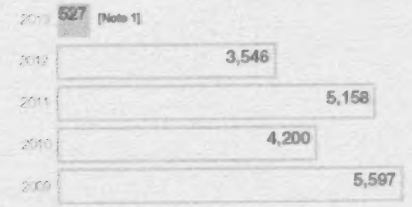


Fig 5-6 Note 1: The 2013 row represents non-compliances identified during physical assessments recorded from January 1, 2013 to April 14, 2013. Due to an enterprise-wide, production information system change, the record of non-compliance information has changed and will no longer be relatable to findings pre- April 15, 2013. Going forward, BCSA will establish a more consistent and meaningful measure of regulatory compliance and importantly, it is working to improve risk understanding by establishing a process for documenting hazards found during assessments of regulated work. For further information, see the management discussion on page 9.

Assessment of operating or in-service units was the continued focus of safety officers. More than 40% of all physical assessments performed were on existing elevators, and focused on the high risk occupancy buildings such as hospitals and shopping malls. In conjunction with assessing in-service units, we also conducted contractor declaration audits. By completing and submitting a declaration, which contain critical safety devices examination and testing required annually or at an interval specified by the Safety Code, contractors are declaring the elevating device is safe to operate. From the assessment and auditing of operating units, we found that mandatory maintenance requirements, as required by regulation, were not consistently performed due to lack of awareness and understanding by owners, contractors and maintenance personnel.

Managing Elevating Devices Safety Risks

Stakeholder Engagement

In advance of proposed certification requirements for the elevating devices industry, BCSA has maintained regular communications with elevating device contractors and workers. Feedback with regards to program development and implementation are collected on a regular basis and adjustments to the program are taken under consideration and made accordingly.

In 2013, the Elevating Devices Technology Advisory Committee met three times and continued their work in working groups addressing the following technical safety issues:

- emergency operations of elevating devices; and,
- safety considerations for private residences elevating devices.

Media Relations

BCSA took the following media relations actions in 2013 related to elevating devices safety. A listing of all media relations can be found in Appendix F.

TABLE 5-3: Elevating Devices Media Relations

ACTION	DESCRIPTION
Media release	Sent to trade publications to inform clients/industry about enforcement activities. In 2012, BCSA took 129 enforcement actions against contractors, equipment owners and others doing work in BCSA-regulated industry sectors for failing to comply with safety requirements and unlawfully performing regulated work.
Media interview	BCSA's president & CEO provided comment and context for a Canadian Home Builders Association (CHBA) BC Homes Magazine story on professionalism in the construction industry.
Media release	Sent to trade publications to inform clients/industry about enforcement activities. BCSA took 48 enforcement actions against contractors, equipment owners and others doing work or using regulated equipment in BCSA-regulated technologies in the first half of 2013.
Media release and media interview	BCSA released a call for nominations for the Lieutenant Governor Safety Awards 2013. BCSA's president & CEO also provided comment and context during a radio interview on this topic.
Media release	BCSA's president & CEO provided the Educational Facilities Managers Association of BC – Ops Talk with an article on risk managing complex technical systems.
Media release	BCSA released information regarding the recipients of BCSA's Lieutenant Governor Safety Award.
Media release	BCSA announced that the recipients of BCSA's Lieutenant Governor Safety Award will be honoured in an awards ceremony.

Licensing and Certification

BCSA requires that elevators are installed, operated and maintained by qualified and knowledgeable professionals. In 2013, two new contractor licences and 163 certificates of qualification were issued.

TABLE 5-4: New Elevating Devices Licences and Certificates of Qualification Issued

TYPE	DOCUMENT	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Licence	Contractor Licence	2	7
Certificate of Qualification	Car Switch & Construction Elevator Operator	135	103
	Personnel Hoist & Construction Elevator Operator	28	41

Enforcement Actions

In 2013, seven compliance orders and one sanction were issued, details of which are included in Appendices B1 and B2.

TABLE 5-5: Elevating Devices Enforcement actions Taken

ACTION	CATEGORY	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Compliance Order	No permit	4	0
	Failure to address a safety hazard	1	0
	No contractor's licence	1	0
	Outstanding non-compliances	1	1
Sanction	No permit	1	1

Regulatory Instruments and Amendments

There was an amendment to the Elevating Devices Safety Regulation that adopted the latest edition of the CSA B355 Lifts for Persons with Physical Disabilities Code. This ensures that elevating device contractors have access to the latest technological advances that are now covered by the code. Also, BCSA issues safety orders, directives and information bulletins to stop unsafe activity and provide clarification of regulatory requirements and interpretations. Additional details can be found in Appendix C or at www.safetyauthority.ca.

TABLE 5-6: Elevating Devices Regulatory Instruments Issued

TYPE	DOC NO.	TITLE/DESCRIPTION
Safety Order	SO-ED 2013-01	Hydraulic Elevators – Griffin Controllers
Directive	D-L4 110803 5 Revision 03	Major & Minor Alterations
Bulletin	IB-ED-2013-01	Changes For Elevating Devices Operating Permits: New Installations
Bulletin	IB-ED-2013-02	Elevating Devices Safety Regulation – Notification Of Amendment
Recommendation for Amendment	N/A	Elevator Mechanic Certification (originally submitted in 2012)
Amendment	N/A	CSA B355 Lifts for Persons with Physical Disabilities adopted

Safety Manager's Discussion

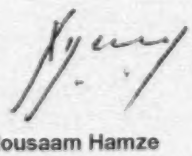
A fundamental building block of the safety system is holding duty holders responsible for technical safety. Duty holders are any person or company responsible for compliance because they either own or work on regulated products or equipment. Implementing the Elevator Mechanic Certification Program aligns with our strategic objectives to hold individuals who perform regulated work responsible and to ensure they have adequate knowledge and skills. Implementation of this program began in July 2013 with a one year transition to allow for individuals to apply for grand parenting, challenge the exam, and enroll in the approved education programs. We continue to engage industry throughout the process, and will work with them to meet the challenge of administering a new program and ensuring there are certified individuals to perform regulated work aligned with their scope of licence.

Auditing the performance of a contractor and providing feedback for them to improve their processes and policies will affect a wider system change on all elevating devices they install, maintain and alter. Into 2014, we will continue to perform physical assessments while shifting our oversight resources to contractor audits.

The hydraulic elevators with single bottom cylinders safety order is due to be completed on October 8, 2015. As per the requirement of the safety order, 444 owners and property managers submitted their compliance plans. We have anticipated that approximately 1,155 units will be affected and/or subject to verification by the above mentioned safety order. To ensure full industry compliance, we will continue communicating further with related owners and property managers.

Since the issuance of the Major and Minor Alterations directive, the document has been upgraded a number of times to reflect concerns voiced by industry. The first version was issued in August 2011, making it more straightforward for contractors to identify alterations that will require an engineering review and signoff. Although most minor alterations do not require an engineering signoff on design registrations, specific minor alterations (e.g., cab modernisations) will still require an engineering review to certify compliance to the code requirements.

Educating owners and property managers on their responsibility and on how they can better manage their contractors will also be a continued focus in 2014. Exchanging real time information, such as incident reporting, will help all parties take appropriate and timely action towards greater safety outcomes.

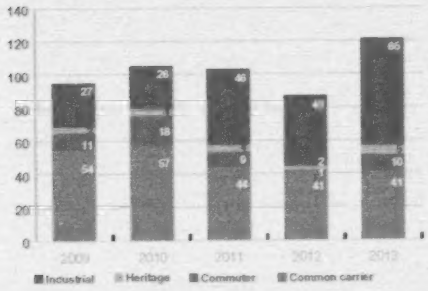


Housaam Hamze
Acting Elevating Devices Safety Manager

Understanding Railway Safety Risks

In the Railway Safety Program at BCSA, we regulate railways that operate solely within British Columbia and have a Minister's Certificate issued by the BC Ministry of Transportation and Infrastructure. Provincial Railways are subject to the British Columbia *Railway Act, Railway Safety Act* and adopted Federal railway safety legislation. In the Railway Safety Program, we regulate five classes of railways: common carrier, heritage, commuter, industrial and just recently added, industrial sidings and spurs.

FIGURE 6-1:
Railway Accidents and Incidents 2009-2013



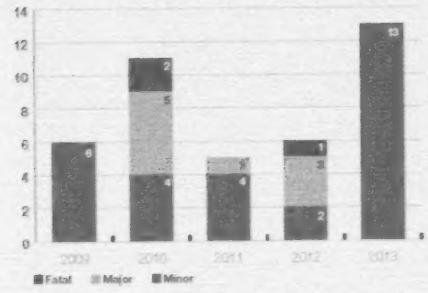
Note: Accidents and Incidents occurring on railway property that are not directly related to a railway's compliance to legislation and performance are excluded. Due to the similar nature in operations and complexity and for consistency in reporting, industrial railways and industrial siding and spur railways are combined.

Accidents and Incidents

Railway accidents and incidents are reported in accordance with adopted federal regulations. Figure 6-1 summarizes the accidents and incidents reported to BCSA involving railway equipment. Typically, these accidents and incidents are low speed and low risk. Many of the accidents can be attributed to human error and violations to rules and procedures. The Railway Safety Program annually focuses its assessments and audits on employee training and the requirements for railway operators to perform proficiency testing on their railway employees.

2013 statistics indicate an increase of accident and incidents over the pervious year. As mentioned in last year's report this may be attributed to better reporting by provincial railways. As well, increased volumes are also directly correlated with the increase in number of provincially regulated railways. This will be expected as the program identifies more industrial sidings and spurs and incorporate them into the provincial safety regime. It is important to note that there has not been any increase to high risk accidents or incidents.

FIGURE 6-2:
Railway Injuries Reported



Note: Injuries on railway property that are not directly related to a railway's compliance to legislation and performance are excluded.

Injuries

Provincial railways are required to report injuries that are a result of railway operations to BCSA. This includes injuries to workers performing train operations or injuries to the public on railway property as a result of train operations.

Assessments of Regulated Work

Railway safety officers assess and audit all operating railways as part of regular oversight. Assessments may result with non-compliances where the railway is found to not comply with the applicable acts, regulations, rules and guidelines. Railway operations are also audited against their Safety Management Systems (SMS), which are required for all railways, and the Railway Safety Program issues recommendations as a result of these audits.

FIGURE 6-3: Operating Railways [Note 1]

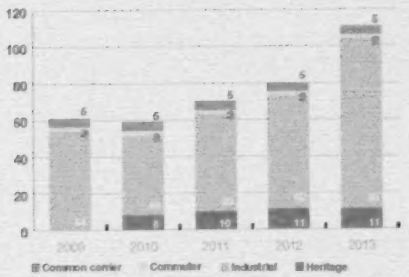


FIGURE 6-4: Assessments, Non-compliances, Recommendations

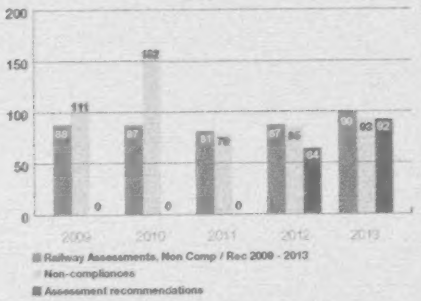


FIGURE 6-5: Audits, Recommendations, Responses

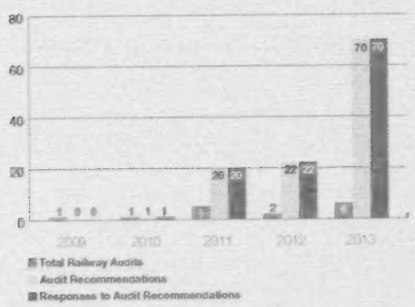
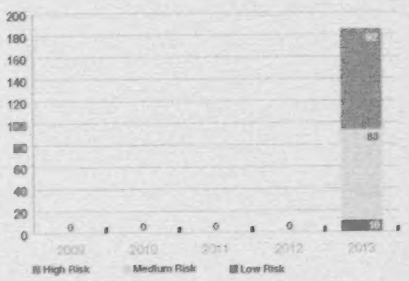


FIGURE 6-6: As-found Risk Conditions [Note 2]



Note 1: Due to the similar nature in operations and complexity and for consistency in reporting, industrial railways and industrial siding and spur railways are combined.
Note 2: In 2013 the Railway Safety Program assessed railways using the traditional risk matrix (Probability & Severity) in its understanding and recording of As-found Conditions.

The Railway Safety Program's 2013 Work Plan for assessing railway safety activity was determined and directed by findings revealed in noncompliances from assessments and audits performed in 2012. In 2013, 99 assessments and six audits were conducted on 111 provincial railway Safety Management Systems (SMS); with a focus on employee training and oversight. These assessments and audits resulted in the total issuance of 93 non-compliances and 162 recommendations in the areas of Employee Training & Qualification, Performance Management, Rules Respecting Track Safety and non-compliance to Canadian Railway Operating Rules (CROR) and Regulations.

Managing Railway Safety Risks

Stakeholder Engagement and Town Hall Meetings

In 2013, BCSA held three town hall meetings with stakeholders in Kamloops, Prince George and New Westminster to discuss industry issues, challenges and opportunities. This stakeholder engagement structure is used in railways in lieu of having a Technology Advisory Committee.

Discussions at these town halls included the following topics:

- a review of assessment and audit activity in 2013;
- annual statistics;
- accident reporting;
- directives, bulletins and advisories issued in 2013;
- how to utilize the newly updated railway web page;
- information on the daily responsibilities of a railway safety officer;
- open forum for opportunities for education expressing opinions or concerns; and
- review of what 2014 has in store.

Media Relations

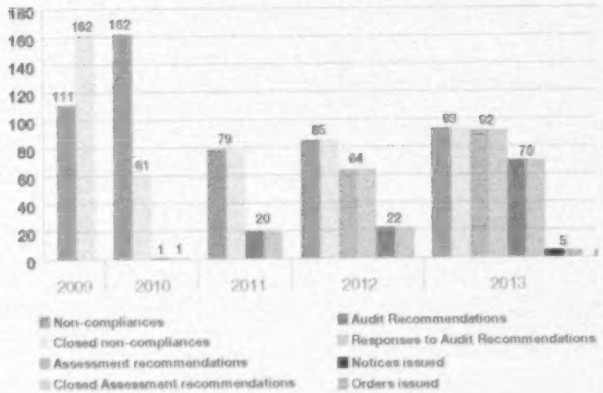
BCSA took the following media relations actions in 2013 related to railway safety. A listing of all media relations can be found in Appendix F.

TABLE 6-1: Railway Media Relations

ACTION	DESCRIPTION
Media release	BCSA provided content and advice to the Abbotsford RCMP for their YouTube video regarding safety at the Vye Road Rail Crossing.
Media interview	BCSA railway safety manager provided comment and context to a media inquiry regarding the installation of crossing arms at Abbotsford's Vye Road crossing.
Media release and media interview	BCSA released a call for nominations for the Lieutenant Governor Safety Awards 2013. BCSA president & CEO also provided comment and context during a radio interview on this topic.
Media interview	A BCSA communications officer provided comment and context during a media interview about incidents that occurred at Lower Mainland railway crossings, including safety tips for pedestrians and vehicle operators.
Media release	BCSA released information regarding the recipients of BCSA's Lieutenant Governor Safety Award.
Media release	BCSA announced that the recipients of BCSA's Lieutenant Governor Safety Award will be honoured in an awards ceremony.

Enforcement

FIGURE 6-7: Railway Enforcement



Regulatory Instruments

BCSA issues emergency directives, safety advisories and information bulletins to stop unsafe activity and provide clarification of regulatory requirements and interpretations. Additional details can be found in Appendix C or at www.safetyauthority.ca.

TABLE 6-2: Railway Regulatory Instruments Issued

TYPE	DOC NO.	TITLE/DESCRIPTION
Emergency Directive	R2013-09-05	Safety and Security of Locomotives & Car Moving Equipment
Emergency Directive	R2013-09-06	Use of Un-Authorized Electronic Devices For Employees in Safety Critical Positions
Bulletin	R-2013-04-25	Contractors Working on Provincial Railway Properties
Bulletin	R-2013-04-26	Industrial Railways Compliance To: Canadian Railway Operating Rules (CROR) "SIGNALS"
Bulletin	R2013-11-27	Bridges and Culverts Mitigating Risks During and After Severe Weather
Bulletin	R2013-11-28	Railway Operations in Winter Conditions
Safety Advisory	None	Railway Employee Fatality in Calgary, Alberta

Safety Manager's Discussion

The mandate for BCSA's Railway Safety Program is to provide the public, stakeholders and provincial railways with a high level of confidence that railway operations in British Columbia are safe. In 2013, the Railway Safety Program continued its efforts to identify, understand and manage hazardous conditions that may threaten safe railway operations.

Safety Management System (SMS) is the foundation for railway safety in Canada and the Railway Safety Program in BC. Railways must have defined safety targets, they must risk assess their operation and must comply with all applicable rules, regulations and guidelines. Reviewing and learning from assessment and auditing activities that occurred in 2012 were very important to BCSA's understanding of hazardous conditions on our provincial railways. As reported last year, the Railway Safety Program continues to approach the training and qualifications of railway workers as one of the most important aspects of railway safety. It is important to understand that a majority of provincial railways are industrial and not as sophisticated as the national railways that operate across Canada. They tend to be small, lack experience, lack resources and use equipment not directly designed for the movement of railway equipment. Regardless, workers in safety critical positions who move railway equipment must be well-trained and well-supervised; this is why BCSA's focus must continue to be on the training and qualifications of the employees who perform the work.

In 2013, the Railway Safety Program continued to assess and audit all industrial and heritage railway training and performance management programs. Railway safety officers issued a total of 19 non-compliances against training requirements to railways that did not have adequate training in place for their railway employees. Of the 19 non-compliances issued, 6 were considered high risk. Further, 14 non-compliances were issued against proficiency testing and supervision of railway employees who work in safety critical positions. Provincial railways are required to respond to non-compliance within 14 days with a compliance plan to correct the identified non-compliance.

2013 also provided a dark moment that will be forever imbedded in Canadian railway history with the tragic event of Lac Mégantic Quebec. On July 6, 2013, a 74 car bulk train containing Bakken formation crude oil ran-away and entered the town at high speed; the end result was that the train derailed and exploded. That day 47 people lost their lives and a community was changed forever.

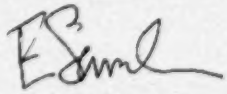
To understand what occurred at Lac Mégantic and to determine if the same hazardous conditions exist in BC, a review of railway operations in the province was conducted. Some of the conditions and early findings from the ongoing investigation were:

- The railway operated with a one-person crew.
- The train was a bulk train of dangerous goods.
- The train may have not been properly secured to be left unattended.
- The train was left on a gradient.

To respond to these findings, there are no main line railway operations within the province of BC that operate with a one-person crew. Further, no railway operations handle dangerous goods bulk trains at this time. As well, track conditions and operating practices for provincial railways do not provide for trains to be staged on tracks with similar grade.

Taking action, BCSA issued a directive in concert with Transport Canada, to all provincial railways requiring them to ensure that they properly secure their equipment as per current operating rules. BCSA's Railway Safety Program will continue to monitor, educate and lead provincial railways on safe railway practices.

The Railway Safety Program will continue its efforts to ensure all railway operations are part of the regulatory regime in British Columbia. The program will continue to have high expectations of our provincial railways in all aspects of railway safety.

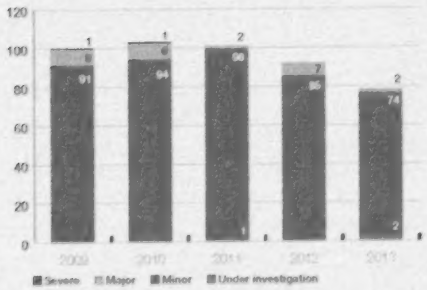


Eric Samuelson
Railway Safety Manager

Understanding Passenger Ropeways Safety Risks

In the Passenger Ropeways Safety Program at BCSA, we are responsible for overseeing the safety of passenger ropeways throughout BC in accordance with the *Safety Standards Act* and the Elevating Devices Safety Regulation. Passenger ropeways include tramways, gondolas, chairlifts, rope tows and passenger conveyors.

FIGURE 7-1:
PR Incident Reports 2009-2013



Incidents

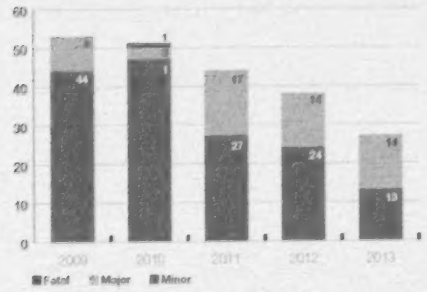
The following summarizes incidents reported to BCSA involving passenger ropeway (PR) equipment.

TABLE 7-1: Major PR Incidents in 2013

RATING	QTY.	DESCRIPTION
Major	2	Falls on ramp after unloading

There has been a slow, steady decline in the overall number and type of incidents reported that started in 2010 and continued in 2013. Most *MINOR* incidents involved passengers falling when loading or unloading from passenger carriers, deropements and equipment failures that required passengers to be evacuated from the carriers. A summary of closed incidents is included in Appendix A.

FIGURE 7-2:
Injuries Reported 2009-2013



Injuries

Injuries reported as a result of passenger ropeway incidents in 2013 are summarized below.

TABLE 7-2: Major Injuries Reported in 2013

RATING	QTY.	DESCRIPTION
Major	14	(Possible) concussions, fractures, dislocations, soft tissue injuries

The number of *MINOR* injuries reported in 2013 continues to decline year after year. *MINOR* injuries reported in 2013 were typically bruises, soft tissue injuries and general discomfort resulting from falls and trips on passenger ropeway equipment or contact with carriers.

Assessments of Regulated Work

Passenger ropeway safety officers assess new installations as well as operating equipment as part of regular maintenance. Non-compliances are recorded when work does not conform to the applicable regulation.

FIGURE 7-3: PR Installation Permits

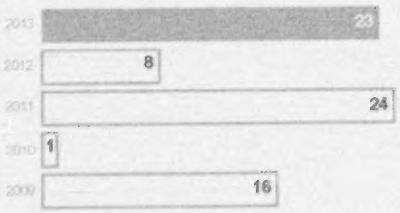


FIGURE 7-4: PR Operating Permits

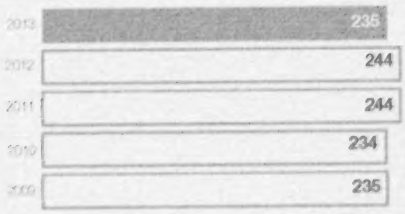


FIGURE 7-5: PR Physical Assessments

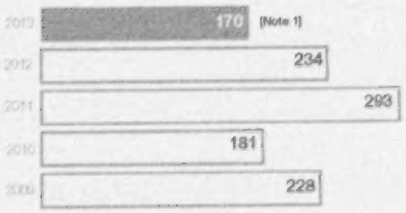


FIGURE 7-6: PR Non-Compliances Identified

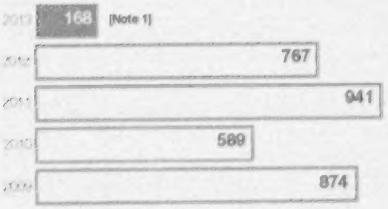


Fig 7-5 Note 1: See management discussion on page 9 for interpretation of reduced physical assessments in 2013.
Fig 7-6 Note 1: The 2013 row represents non-compliances identified during physical assessments recorded from January 1, 2013 to April 14, 2013. Due to an enterprise-wide, production information system change, the record of non-compliance information has changed and will no longer be relatable to findings pre- April 15, 2013. Going forward, BCSA will establish a more consistent and meaningful measure of regulatory compliance and importantly, it is working to improve risk understanding by establishing a process for documenting hazards found during assessments of regulated work. For further information, see the management discussion on page 9.

The number of new and modified passenger ropeways increased significantly in 2013. A new eight-passenger sightseeing gondola, one new detachable six-passenger chairlift, and two relocated chairlift installations are of note for 2013. Relocated installations are considered to be new and are required to be designed to meet the current codes and regulations. The number of incidents on passenger ropeways is on a steady decline since 2011 and the number of injuries has followed the same curve. Major injuries show a slight increase; however, it is important to note that once an injured passenger is sent for professional medical attention as a precaution to rule out back and neck injuries, it is noted in the database as a major injury. In many cases, BCSA is unable to obtain updated information on the actual medical status of persons who are sent to hospital as a precaution to rule out serious injuries.

Managing Passenger Ropeways Safety Risks

Stakeholder Engagement

Passenger ropeway stakeholders were introduced to the Resource Allocation Program (RAP) currently being integrated into their technology. As part of this integration, BCSA shared updated information regarding risk factors typically taken into consideration by safety officers when conducting an assessment of passenger ropeway equipment.

The Passenger Ropeways Technology Advisory Committee met twice in 2013, and has established the need for two working groups to discuss and address the following technical safety issues:

- mitigating risks for aging ropeways in BC; and
- certification of passenger ropeway maintenance personnel.

Media Relations

BCSA took the following media relations actions in 2013 related to passenger ropeways safety. A listing of all media relations can be found in Appendix F.

TABLE 7-3: Passenger Ropeways Media Relations

ACTION	DESCRIPTION
Media release	Sent to trade publications to inform clients/industry about enforcement activities. In 2012, BCSA took 129 enforcement actions against contractors, equipment owners and others doing work in BCSA-regulated industry sectors for failing to comply with safety requirements and unlawfully performing regulated work.
Media release	Sent to trade publications to inform clients/industry about enforcement activities. BCSA took 48 enforcement actions against contractors, equipment owners and others doing work or using regulated equipment in BCSA-regulated technologies in the first half of 2013.
Media release and media interview	BCSA released a call for nominations for the Lieutenant Governor Safety Awards 2013. BCSA's president & CEO also provided comment and context during a radio interview on this topic.
Media interviews	A BCSA communications officer provided comment and context during three separate media interviews about the work and involvement of BCSA with a major property development on Kelowna Mountain.
Media release	BCSA released information regarding the recipients of BCSA's Lieutenant Governor Safety Award.
Media release	BCSA announced that the recipients of BCSA's Lieutenant Governor Safety Award will be honoured in an awards ceremony.

Licensing and Certification

BCSA requires that passenger ropeway equipment is installed, operated and maintained by qualified and knowledgeable professionals. In 2013, two licences and six certificates of qualification were issued to individuals that demonstrated the minimum required capabilities to produce safe work.

TABLE 7-4: New Passenger Ropeways Licences and Certificates of Qualification Issued

TYPE	DOCUMENT	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Licence	Contractor Licence	2	2
Certificate of Qualification	PRTC - Fixed Grip	2	1
	PRTHT - Restricted to handle tows	1	0
	PRTB - all unit types except Reversibles	3	0

Enforcement

In 2013, two compliance orders and two sanctions were issued, details of which are included in Appendices B1 and B2.

TABLE 7-5: PR Enforcement Actions

ACTION	CATEGORY	QTY. ISSUED IN 2013	REFERENCE: QTY. ISSUED IN 2012
Compliance Order	Failure to address a safety hazard	1	0
	Failure to take regulated safety precautions	1	0
Sanction	Failure to comply with a safety order	1	0
	Failure to comply with a condition of a license (competency)	1	0

Regulatory Instruments and Amendments

BCSA issues safety orders, directives and information bulletins to stop unsafe activity and provide clarification of regulatory requirements and interpretations. Additional details can be found in Appendix C or at www.safetyauthority.ca.

There is no safety regulation in BC specific to passenger ropeways. Passenger ropeways regulatory requirements are captured in the Elevating Devices Safety Regulation. In 2013, there were no amendments to the Elevating Devices Safety Regulation that affect passenger ropeways.

TABLE 7-6: Passenger Ropeways Regulatory Instruments Issued

[illegible]	DOC NO.	TITLE/DESCRIPTION
Di[illegible]	D-P4 070101 1 Revision 4	Incident Reporting Requirements With Respect To Passenger Ropeways And Passenger Conveyors

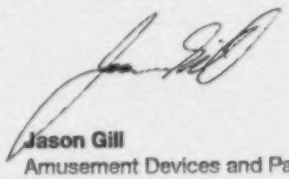
Safety Manager's Discussion

The amount of incident data gathered in 2013 continues to decline compared with previous years. A change in reporting practice and perhaps a slow start to the 2013/2014 ski season due to lack of snow in southern coastal regions may have contributed to the lower numbers. There were approximately 70% fewer incidents from November through December in 2013 compared with the previous year. Incidents of note in 2013 were related to maintenance personnel that had not received the required training to obtain the competency skills for maintaining and operating passenger ropeways. This lack of knowledge in certain instances resulted in the inability to properly assess technical problems and has exposed passengers and maintenance personnel to unnecessary risk. These occurrences strengthen the case to develop and implement a mechanics certification program for this industry.

A new risk-informed Resource Allocation Program (RAP) tool was piloted in 2013 to prioritize inspection resources for operating permits. This tool was assessed and calibrated in the 2013 season using as-found observations through physical assessments and by evaluating factors such as competency of the persons performing regulated work on passenger ropeways. Thresholds have been established for the scores generated by RAP that inform the safety officers of when they must initiate a physical assessment and when allocating the resource is discretionary. This will ensure that we are deploying our resources to where the highest risk-informed priorities reside. In 2014, BCSA intends to integrate this tool with our new database system. BCSA will begin consultation and development of a plan to implement a passenger ropeways mechanic certification program in 2014. This initiative may require one or all individuals under a passenger ropeways contractor licence to be examined and certified. A Risk Reduction Group has been formed by our Technical Advisory Committee to provide recommendations to BCSA in 2014 on approaches to be undertaken by BCSA in 2015.

A new edition of the national passenger ropeway standard in Canada, CSA Z98, will be published in 2014 and BCSA will begin the process of adoption for this standard in the regulation. This process will inform our clients of the upcoming changes; however the new edition will have little impact on existing passenger ropeways. BCSA is aware of one new passenger ropeway installation proposed for 2014; however we typically do not have a true picture of the number of new installations that are to be built in a calendar year until near the end of season for the ski season in BC. There are many new resort proposals in BC that may increase the amount of passenger ropeway installations in the future but many of these proposals are challenged by a lack of market need in the province and are at various stages of the approval process with the provincial government.

As the public continues to enjoy various passenger ropeways for year-round recreation, BCSA encourages industry to properly educate both their clients and staff on the safe use of this equipment for the best possible safety outcomes.

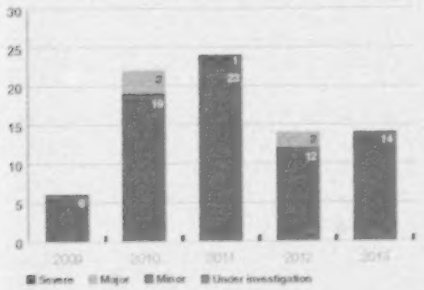


Jason Gill
Amusement Devices and Passenger Ropeways Safety Manager

Understanding Amusement Devices Safety Risks

In the Amusement Devices (AD) Safety Program at BCSA, we are responsible for overseeing the safety of amusement ride installation and operation throughout BC in accordance with the *Safety Standards Act* and the Elevating Devices Safety Regulation. The types of regulated amusement devices range from small waterslides and inflatable play equipment to larger rides such as roller coasters operating at the Pacific National Exhibition.

FIGURE 8-1:
AD Incident Reports 2009-20133

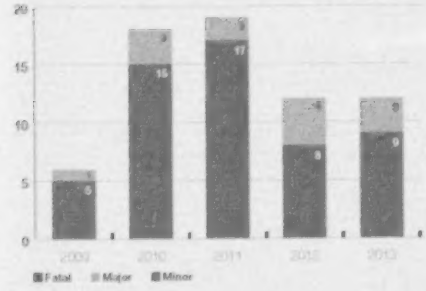


Incidents

The following summarizes incidents reported to BCSA involving regulated amusement devices.

There were no significant changes to the number and type of incidents reported to BCSA in 2013 compared to previous years. Most *MINOR* incidents involved passengers riding waterslides. A summary of incidents is included in Appendix A.

FIGURE 8-2:
AD Injuries Reported 2009-2013



Injuries

Injuries reported as a result of amusement device incidents are summarized below.

TABLE 8-1: Major Injuries Reported in 2013

RATING	QTY.	DESCRIPTION
Major	2	(Possible) Concussions
	1	Fractured ankle

There were no significant changes to the number and type of injuries resulting from incidents occurring in 2013. *MINOR* injuries were typically bruises, lacerations, pain and discomfort.

Assessments of Regulated Work

Amusement devices safety officers assess new installations as well as operating equipment as part of regular maintenance. Non-compliances are recorded when work does not conform to the applicable regulation.

FIGURE 8-3: AD Installation Permits

FIGURE 8-4: AD Operating Permits

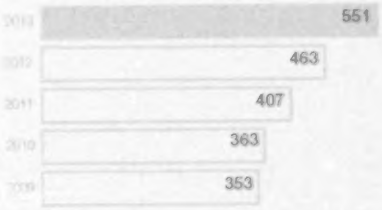


FIGURE 8-5: AD Physical Assessments

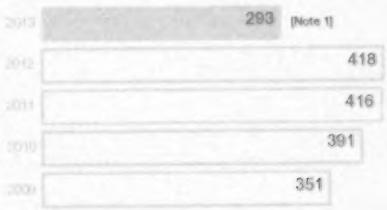


FIGURE 8-6: AD Non-Compliances Identified

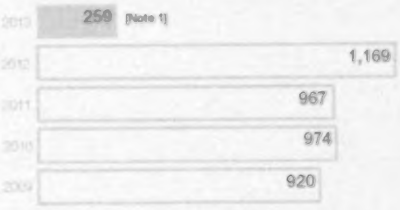


Fig 8-5 Note 1: See management discussion on page 9 for interpretation of reduced physical assessments in 2013.
Fig 8-6 Note 1: The 2013 row represents non-compliances identified during physical assessments recorded from January 1, 2013 to April 14, 2013. Due to an enterprise-wide, production information system change, the record of non-compliance information has changed and will no longer be relatable to findings pre- April 15, 2013. Going forward, BCSA will establish a more consistent and meaningful measure of regulatory compliance and importantly, it is working to improve risk understanding by establishing a process for documenting hazards found during assessments of regulated work. For further information, see the management discussion on page 9.

A significant increase in the volume of installation permits and operating permits is a direct result of an increase in inflatable amusement devices such as slides and bounce houses. The decline in the number of physical assessments is partly a result of the required acceptance assessments for the above-noted installation permits that require more time and effort on the part of the safety officer which, in turn, leaves less time for discretionary assessments.

Managing Amusement Devices Safety Risks

Stakeholder Engagement

Engaging a diverse group such as the amusement rides technology presented a challenge to find commonalities between such different types of equipment. This challenge gave rise to four sub-committees focused on four of the major industries within the technology: ziplines; waterslides; amusement rides; and inflatables. The ziplines and waterslides sub-committees met for the first time in 2013.

Across all sub-committees, the Amusement Devices Technology Advisory Committee has established the need for one working group to address the following regulatory improvement issue:

- review regulatory requirements for all ziplines in BC.

Media Relations

BCSA took the following media relations actions in 2013 related to amusement devices safety. A listing of all media relations can be found in Appendix F.

TABLE 8-2: Amusement Devices Media Relations

ACTION	DESCRIPTION
Media release	Sent to trade publications to inform clients/industry about enforcement activities. In 2012, BCSA took 129 enforcement actions against contractors, equipment owners and others doing work in BCSA-regulated industry sectors for failing to comply with safety requirements and unlawfully performing regulated work.
Media interview	BCSA's amusement devices safety manager provided comment and context during a media interview about the safety of amusement devices in British Columbia.
Media release	Sent to trade publications to inform clients/industry about enforcement activities. BCSA took 48 enforcement actions against contractors, equipment owners and others doing work or using regulated equipment in BCSA-regulated technologies in the first half of 2013.
Media interview	BCSA's leader for communications & media relations provided comment and context during a media interview regarding the practice of using wooding blocking to support a portable amusement ride, which is a common practice in the amusement ride industry.
Media release and media interview	BCSA released a call for nominations for the Lieutenant Governor Safety Awards 2013. BCSA president & CEO also provided comment and context during a radio interview on this topic.
Media release	BCSA released information regarding the recipients of BCSA's Lieutenant Governor Safety Award.
Media release	BCSA announced that the recipients of BCSA's Lieutenant Governor Safety Award will be honoured in an awards ceremony.

Licensing and Certification

BCSA requires that amusement devices are installed, operated and maintained by qualified and knowledgeable professionals. In 2013, 30 amusement devices contractor licences were issued.

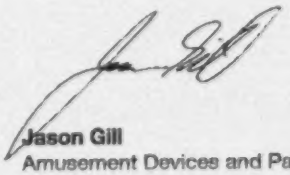
Safety Manager's Discussion

The data collected through client incident reporting shows a slight increase in 2013. The reporting of incidents has improved with a majority of reports now being submitted by our clients as apposed to members of the public; this reflects the efforts we have made to ensure our clients are aware of reporting requirements. Operating permits in this technology continue to rise as we engage more operations that are found to be operating outside of the Act and Regulations. A majority of these new operations are inflatable amusement device operators. We continue to assess new devices that were brought into the province to determine if they fit the definition in our regulations, such as wakeboarder tow devices (two new operators of wakeboarder tow devices are now being regulated in BC). Many new contractors have been brought into the system that may not understand their obligations under the applicable legislation. Assessment and education of new and existing contractors continues to be a focus to mitigate risks in the amusement device technology. Enforcement action is taken when these interventions fail. In the future, certification of amusement device duty holders to verify that responsible individuals are trained and competent will be explored.

In 2013, a new approach to the Amusement Devices Technical Advisory Committee was introduced to our clients. Four new subsector technical advisory committees were formed to address the different needs of amusement ride, waterslide, zipline and inflatable sectors. The waterslide and zipline sectors met in 2013 and discussed topics such as incident reporting, installation permit requirements and code development. There was some difficulty in engaging participants in the inflatable and amusement ride sectors so a meeting was not possible in 2013; however, this will be rectified in 2014.

A new Canadian source document that recognizes US ASTM F24 amusement ride and device core standards for such areas as design, maintenance and operations will be published in 2014. This is a result of a six-year harmonization effort undertaken by a CSA/ASTM technical committee. Once published, authorities having jurisdiction across Canada may start the process of adopting this Canadian source document into their regulations. BCSA will begin the process of adoption in 2014 which includes consultation with stakeholders and identifying possible deviations before a request is sent to the provincial government for regulatory amendment. Harmonization will level the playing field across North America in this sector and we will continue this effort to recognize ride and device specific standards being developed at ASTM with Canadian participation.

Continued growth in this sector is anticipated in 2014 as we continue to engage with operators that were not participating in the safety system and as new devices are assessed. Educating duty holders on their responsibility to ensure operations are within the safety system will continue to be a focus going forward.



Jason Gill
Amusement Devices and Passenger Ropeways Safety Manager

Appendix A: Incident Summaries

Incidents that are UNDER INVESTIGATION are excluded from these lists. Tables are sorted by Incident Rating and Date except where noted.

TABLE A-1: ELECTRICAL INCIDENTS

INCIDENT RATING	DATE	CITY	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Severe	3-Apr-2013	Langley	8	Smoke inhalation, anxiety (6); Possible stroke (1); Fatality(1)	Fatal, Major, Minor	Fire, smoke, water damage	A fire occurred at a multi-family residence. Although the cause of the fire is undetermined, electrical equipment is suspected to be involved.
Severe	14-Dec-2013	Mission	0	N/A	N/A	Engine compartment damaged	A fire occurred in the engine compartment of a fire truck. Electrical equipment is suspected to be involved.
Major	28-Jan-2013	Port Coquitlam	0	N/A	N/A	Fire, smoke, water damage	A fire occurred at a single-family residence. Although the cause of the fire was undetermined, electrical was suspected to be involved.
Major	31-Jan-2013	Langley	0	N/A	N/A	Fire, smoke, water damage	A fire occurred at a single-family residence. Although the cause of the fire was undetermined, electrical was suspected to be involved.
Major	7-Feb-2013	Fort Langley	0	N/A	N/A	Recreational vehicle destroyed	A fire occurred at a recreational premise. It was reported that the fire began under the refrigerator unit, which was a combination propane gas/electric type unit.
Major	19-Mar-2013	Saanich	0	N/A	N/A	Fire damage	A fire occurred at a multi-family residence. Electrical equipment was suspected to be involved.
Major	10-May-2013	Kelowna	2	(Not specified)	Minor	Fire, structural damage.	A fire occurred at a commercial premise. Although the cause of the fire was undetermined, electrical is suspected to be involved.
Major	3-Jun-2013	Prince George	1	Smoke inhalation	Minor	Fire, smoke, water damage	A fire occurred in a suite at a single-family residence. The utility's procedures and the location of combustible materials are suspected to have caused the incident.
Major	6-Jun-2013	White Rock	2	1- second and third degree burns, surgeries required; 1- electrical shocks causing burns and unconsciousness	Major	None	High voltage contact incident; A metal street light pole contacted a high voltage overhead line during installation.
Major	13-Jun-2013	Prince George	1	Smoke inhalation	Minor	Fire, smoke, water damage	Two electrical circuits arced and started a fire beside the electrical panel at a single-family residence.
Major	13-Jun-2013	Penticton	1	Arc flash exposure; hospitalization required	Minor	None	An arc flash incident occurred when a person (employee) was working on a pump motor.
Major	21-Jun-2013	Campbell River	0	N/A damage	N/A	Fire, smoke, water	A fire occurred at a commercial premise. Electrical equipment is suspected to be involved.
Major	22-Jun-2013	Winfield	1	Electrical shock, bruising	Minor	None	A person (employee) received electrical shocks after contacting energized equipment.
Major	4-Jul-2013	Kelowna	1	Burn	Minor	Fire, smoke, water damage	A fire occurred at a single-family residence. Electrical equipment is suspected to be involved.
Major	15-Jul-2013	Moricetown	2	1 - burns; 1 - temporary blindness from arc flash	Minor	30A control tub in MCC damaged	An arc flash occurred at an industrial premise.
Major	22-Jul-2013	Abbotsford	0	N/A	N/A	Fire, smoke damage	A fire occurred at single-family residence. Although the cause of the fire was undetermined, electrical equipment is suspected to be involved.
Major	23-Jul-2013	Mission	0	N/A	N/A	Fire damage	A fire occurred at a single-family residence. Although the cause could not be determined, it is not believed that electrical equipment is involved.
Major	13-Aug-2013	Vernon	0	N/A	N/A	Two single family dwellings destroyed	A fire occurred at a single-family residence. Electrical equipment was suspected to have caused the incident.
Major	25-Sep-2013	Maple Ridge	0	N/A	N/A	Mill and equipment destroyed.	A fire occurred in an industrial premise (remanufacturing mill). Although the cause of the fire was undetermined, electrical is suspected to be involved.
Minor	12-Jan-2013	Langford	0	N/A	N/A	Smoke, structural damage	A fire occurred at a multi-family residence. Electrical equipment was suspected to be involved.
Minor	14-Jan-2013	Vernon	0	N/A	N/A	Conduit, conductors and meter base destroyed	An electrical fire occurred in the service equipment at a commercial premise. A short circuit occurred from water leaking into the service conduit.
Minor	14-Jan-2013	White Rock	0	N/A	N/A	Appliance (dryer) damaged	A fire occurred in an appliance at a commercial premise. Electrical equipment was suspected to be involved.

TABLE A-1: ELECTRICAL INCIDENTS CONT'D

INCIDENT RATING	DATE	CITY	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Minor	18-Jan-2013	Kelowna	0	N/A	N/A	Fire, smoke damage	A fire occurred at a single-family residence. Electrical was suspected to be involved.
Minor	31-Jan-2013	Port Alberni	0	N/A	N/A	None	A tenant reported concerns with the wiring in her apartment.
Minor	4-Feb-2013	Fort Nelson	0	N/A	N/A	25kV 3 conductor, 1/0 teck cable damaged	While clearing snow, the equipment operator damaged a 25KV high voltage cable crossing the road in a metal pipe.
Minor	15-Feb-2013	Prince George	0	N/A	N/A	Product damaged	A fire occurred at a single-family residence. A tenant reported that a baseboard heater was smoking.
Minor	15-Feb-2013	Fort Nelson	0	N/A	N/A	Arc burns on electrical cabinet	An arc flash occurred at an industrial premise. A circuit breaker in an MCC tripped when the circuit to a pump was energized, without authorization, causing a noise and minor arcing.
Minor	22-Feb-2013	Fort Nelson	0	N/A	N/A	600V disconnect switch damaged	Staff at an industrial premise discovered a damaged disconnect switch.
Minor	2-Mar-2013	Lake Errock	0	N/A	N/A	Heat, fire damage to lamp fixture and components. 45 to 50 young chickens were fatally injured	A fire occurred in a chicken barn (detached structure) at a single-family residence. Electrical equipment was suspected to be involved.
Minor	6-Mar-2013	Fort St John	0	N/A	N/A	Transformer damaged	A 15kVA lighting panel transformer shorted to ground and failed.
Minor	8-Mar-2013	Saanich	1	Smoke inhalation	Minor	Washer, dryer and closet damaged	A fire occurred in the dryer of a stacking washer/dryer unit at a single-family residence.
Minor	12-Mar-2013	Parksville	0	N/A	N/A	Fire damage	A fire occurred at a single-family residence. The fire started below the electrical panel at floor level. The premise was unoccupied at the time of the fire. Electrical equipment was suspected to be involved.
Minor	17-Mar-2013	Kelowna	0	N/A	N/A	Heat, smoke damage	A fire occurred at a commercial premise. Electrical equipment was suspected to be involved.
Minor	17-Mar-2013	Quesnel	0	N/A	N/A	Cable damaged	Cable damaged A fire occurred in an industrial premise. Electrical equipment was suspected to be involved.
Minor	19-Mar-2013	Burns Lake	0	N/A	N/A	Blast damage to two MCC buckets; vertical buss damaged	An arc flash occurred at an industrial premise.
Minor	25-Mar-2013	Fort St James	0	N/A	N/A	Equipment damaged, smoke damage	A fire occurred at an industrial premise. The open design of the welder (equipment) allowed dust to accumulate in the equipment. The accumulation of dust caused the temperature to increase high enough to ignite the wood dust.
Minor	2-Apr-2013	Waneta	0	N/A	N/A	Cables, switching equipment damaged	Overhead communication cables sustained heat-related damage.
Minor	4-Apr-2013	Esquimalt	0	N/A	N/A	Fire damage	A fire occurred at a commercial premise. Electrical equipment is suspected to be involved.
Minor	7-Apr-2013	Prince George	0	N/A	N/A	Fire damage	A fire occurred at a multi-family residence. A 15A circuit breaker failed in the closed position. The faulted circuit overheated and caused the fire.
Minor	10-Apr-2013	Sooke	0	N/A	N/A	No apparent damage to transformer; to be further assessed by the utility.	A vehicle contacted a utility pad-mounted transformer.
Minor	10-Apr-2013	Kelowna	0	N/A	N/A	Equipment damaged	A fire occurred at a single-family residence. Electrical was suspected to be involved.
Minor	22-Apr-2013	Prince George	0	N/A	N/A	Fire, smoke damage	A fire occurred at an institutional premise. Electrical was suspected to be involved.
Minor	28-Apr-2013	Langford	0	N/A	N/A	Structure damaged	A fire occurred at a multi-family residence after an element on the electric range was unintentionally left the control in the 'on' position.
Minor	8-May-2013	Saanich	0	N/A	N/A	Fire damage	A fire occurred at a single-family residence. Electrical equipment is suspected to be involved.
Minor	10-May-2013	Mission	0	N/A	N/A	Smoke, fire damage	A fire occurred at a commercial premise. Electrical equipment is suspected to be involved.
Minor	21-May-2013	Mission	0	N/A	N/A	Power line, power pole, gas line damaged	A fire occurred at an intersection of a public road way when a tree branch fell onto a high voltage power line. The power line broke, fell to the ground and onto a stop sign, causing the ground and a gas line to be energized. The gas line erupted and the gas ignited.

Appendix A: Incident Summaries Cont'd

TABLE A-1: ELECTRICAL INCIDENTS CONT'D

INCIDENT RATING	DATE	CITY	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Minor	21-May-2013	Fort Nelson	0	N/A	N/A	Junction box and associated wiring damaged	A fire occurred at an industrial premise due to a short circuit in a junction box.
Minor	21-May-2013	Dawson Creek	0	N/A	N/A	Components in transfer switch cabinet damaged	A short circuit in the transfer switch cabinet occurred during the testing of a new generator.
Minor	27-May-2013	Courtenay	0	N/A	N/A	Fire, structural damage. One cow had to be euthanized.	A fire occurred at a commercial premise. Although the cause of the fire could not be determined, electrical is suspected to be involved.
Minor	27-May-2013	Fort St James	0	N/A	N/A	Compressor motor destroyed	A fire occurred at an industrial premise. Electrical equipment was suspected to be involved.
Minor	1-Jun-2013	Kelowna	0	N/A	N/A	Fire, smoke damage	A fire occurred at a single-family residence. The installation and electrical equipment are suspected to have caused the incident.
Minor	5-Jun-2013	Kelowna	1	Electrical shock	Minor	Electrical components damaged	A person received an electrical shock while trying to connect a cellular phone charger to an AC adapter that was plugged into a receptacle.
Minor	6-Jun-2013	Dawson Creek	0	N/A	N/A	Drive and wiring destroyed; damage contained to drive unit	While commissioning a 480V variable frequency drive (VFD) and motor on a compressor fan, the VFD faulted and created an internal short circuit within the drive.
Minor	9-Jun-2013	Campbell River	0	N/A	N/A	Fire damage	A fire occurred at a single-family residence. Electrical equipment is suspected to be involved.
Minor	12-Jun-2013	Vancouver	1	Electrical shock	Minor	None	An employee received an electrical shock.
Minor	3-Jul-2013	Castlegar	0	N/A	N/A	Compressor damaged	A fire occurred in the compressor room of an industrial sawmill facility. Electrical equipment is suspected to be involved.
Minor	16-Jul-2013	Peachland	0	N/A	N/A	Fire damage	A fire occurred at a single-family residence due to a failure in the electrical system.
Minor	23-Jul-2013	Langley	0	N/A	N/A	Fire damage A	A fire occurred at a multi-family residence. Electrical equipment is suspected to be involved.
Minor	23-Jul-2013	Osoyoos	0	N/A	N/A	Fire damage	A fire occurred at a mobile home/single-family residence. Electrical equipment is believed to be involved.
Minor	8-Aug-2013	Grand Forks	0	N/A	N/A	Teck 90 cable damaged and three blown fuses	A backhoe contacted a live 480V cable.
Minor	19-Aug-2013	Popkum	0	N/A	N/A	Appliance (dryer) destroyed	A fire occurred in the laundry room of a single-family residence. An electrical failure is believed have caused the fire.
Minor	19-Aug-2013	Fort St James	0	N/A	N/A	600V overhead line damaged	An equipment operator contacted and pulled down a 600V quadruplex overhead line with the boom of the material handler.
Minor	5-Sep-2013	Campbel River	0	N/A	N/A	Discolouration on the chair	A motorized lift-assist chair that was not approved for use in BC overheated and caused burn marks on the chair.
Minor	12-Sep-2013	Kelowna	0	N/A	N/A	3" DB2 conduit damaged	An excavator operator damaged a DB2 conduit that contained live secondary wiring.
Minor	14-Oct-2013	Langley	0	N/A	N/A	Fire damage	A fire occurred in the wall of a commercial premise. Electrical was suspected to have caused the fire.
Minor	16-Oct-2013	Abbotsford	0	N/A	N/A	Electrical service conduit destroyed; water, smoke, fire damage to structure	A fire occurred in a wall of a single-family residence. Electrical equipment is suspected to be the cause.

Appendix A: Incident Summaries Cont'd

TABLE A-2: BOILERS, PRESSURE VESSELS AND REFRIGERATION INCIDENTS

INCIDENT RATING	DATE	CITY	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Major	17-Sep-2013	Vancouver	0	N/A	N/A	One tube ruptured, nine adjacent tubes distorted/deflected. Furnace casing severed.	A furnace water-wall tube ruptured in a high pressure steam boiler. High furnace pressure caused the burner flame to be extinguished and the upper furnace casing to be distorted and ruptured. Inadvertent waterside contamination resulted in equipment failure.
Major	7-Oct-2013	Vancouver	0	N/A	N/A	One tube ruptured; five adjacent tubes distorted; furnace casing and insulation damaged.	A furnace water-wall tube ruptured in a high pressure steam boiler.
Minor	6-Jan-2013	Richmond	0	N/A	N/A	Ruptured oil line	The refrigeration leak detector alarm sounded after a tube oil line ruptured at a commercial premise. The site was evacuated.
Minor	11-Jan-2013	Bear Lake	0	N/A	N/A	Cracks in tubes	Thermal fluid leaks.
Minor	18-Jan-2013	Queanel	0	N/A	N/A	Leak detector damaged, valve #84 'threaded out' (sic)	Uncontrolled release of ammonia.
Minor	18-Jan-2013	Stoddart	0	N/A	N/A	None	An operator (employee) observed a sulphur build-up around around a cooler plug while conducting routine inspections.
Minor	20-Feb-2013	Vancouver	0	N/A	N/A	None	A high pressure steam boiler safety valve failed to open during a hydrostatic test.
Minor	28-Feb-2013	Port Alice	0	N/A	N/A	26" tube section of PB 16 and welded seam damaged	A tube ruptured in the area of lower furnace water wall. The boiler shut down on a flame failure.
Minor	6-Mar-2013	Port Coquitlam	0	N/A	N/A	None	Approximately 500lbs ammonia was released from a refrigeration system at a food processing plant.
Minor	8-Mar-2013	Jedney	0	N/A	N/A	Weld split	Staff found the amine cooler leaking.
Minor	30-Mar-2013	Nanaimo	0	N/A	N/A	Tube eroded	The grate block on a water tube boiler eroded.
Minor	6-Apr-2013	Nanaimo	0	N/A	N/A	Cracked tubes	A unit was shut down due to a leak on a superheater tube. Further inspection revealed three additional cracked tubes.
Minor	16-May-2013	Port Coquitlam	19	Ammonia exposure	Minor	None	Approximately 200lbs ammonia was released from a food processing plant's refrigeration system.
Minor	26-May-2013	Nanaimo	0	N/A	N/A	Cracks, indentations	An operator observed an oil leak at the bottom half of the heat exchanger's expansion joint.
Minor	24-Jul-2013	Revelstoke	0	N/A	N/A	Equipment damaged	A fire occurred on a thermal oil biomass 'combustor' when oil leaking from the hydraulic lines caught fire.
Minor	17-Sep-2013	Golden	0	N/A	N/A	Single tube damaged	A tube leak was found during maintenance (grate cleaning).
Minor	5-Oct-2013	Vancouver	0	N/A	N/A	2950 lbs refrigerant and 165 gal oil lost; leak sensors contaminated with oil and saturated with refrigerant.	A refrigerant (R-134a Tetrafluoroethane) leak occurred at an industrial premise. The leak had occurred at the mechanical seal of the lubrication pump for the high side compressor (of a large heat pump).
Minor	28-Oct-2013	Burnaby	0	N/A	N/A	None	Residents at a multi-family residence reported hearing a 'boom' from the boiler room.
Minor	14-Nov-2013	Vancouver	0	N/A	N/A	Two NPS10 steam compensators damaged beyond repair	Equipment damage occurred when an newly constructed NPS 10 high pressure steam line moved four inches laterally in two directions during the construction hydrostatic pressure test.
Minor	11-Dec-2013	Trail	3	Smoke inhalation	Minor	Vessel damaged	A large pressure vessel which contained a concentrated zinc slurry developed a leak at a lower oxygen injection nozzle. Contents of related compartment sprayed out, in flames, due to sulphur content and injected oxygen.
Minor	15-Dec-2013	Seymour Creek Reserve	0	N/A	N/A	Corrosion at weld	An operator (employee) observed a pinhole leak on suction side.

Appendix A: Incident Summaries Cont'd

TABLE A-3: GAS INCIDENTS

INCIDENT RATING	DATE	CITY	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Severe	14-Feb-2013	Ft St John	2	Fatal injury from fire/explosion	Fatal	Structural damage to modular home and adjacent residences	An explosion and resultant fire occurred at a single-family residence (modular home). Gas equipment was suspected to be involved.
Severe	1-May-2013	Princeton	1	Carbon monoxide (CO) exposure	Fatal	None	A person died from CO poisoning; the improper use of a regulated propane appliance is suspected to be the cause.
Severe	26-May-2013	Burnaby	2	Carbon monoxide (CO) exposure	Fatal	None	Two people died from CO poisoning.
Severe	9-Jun-2013	Olalla	1	Burns	Minor	Vehicles destroyed	A propane explosion occurred in a 5-tonne cargo vehicle that was being used for living accommodations.
Severe	4-Jul-2013	Salmon Arm	1	Fatal injury from fire/explosion	Fatal	Building damaged (doors blown off, roof panels moved) appliances damaged	A propane explosion occurred at an agricultural facility.
Severe	6-Jul-2013	Tappen	1	Fatal injury from fire/explosion	Fatal	Fire damage	An explosion occurred in a recreational vehicle trailer.
Severe	27-Jul-2013	Princeton	0	N/A	N/A	None	During a safety inspection campaign at a recreational premise, gas safety officers discovered regulated gas work that had been completed recently without permits.
Severe	26-Sep-2013	Kelowna	0	N/A	N/A	Building destroyed	A fire occurred at a commercial premise. Although the cause of the fire was undetermined, gas/gas equipment is suspected to be involved.
Severe	4-Oct-2013	Surrey	2	1 - Second- and third degree burns, lost consciousness; 1 - burns	Major, Minor	Fire damage to vehicle	A motor vehicle accident involving an RV occurred. A fire occurred after the accident.
Severe	4-Oct-2013	Cache Creek	1	Carbon monoxide (CO) exposure	Fatal	None	A deceased person was discovered in a cargo trailer converted into a living space. Cause of death has not been determined however CO poisoning is suspected.
Severe	8-Oct-2013	Whistler	1	Burns	Minor	Scorching on vehicle	A propane explosion occurred after an attendant completed filling a propane belly tank on an RV.
Major	16-Jan-2013	Salmon Arm	0	N/A	N/A	None	Elevated carbon monoxide reported at a single-family residence.
Major	18-Jan-2013	Salmon Arm	5	Carbon monoxide (CO) exposure	Major	None	Elevated carbon monoxide (200ppm ambient CO) at a multifamily residence.
Major	31-Jan-2013	Victoria	3	Singed hair	Minor	Food truck damaged	An explosion occurred in a food truck.
Major	3-Feb-2013	Wynndel	0	N/A	N/A	Kiln and aluminum Ibeams damaged	A fire occurred at an industrial premise after a fire tube failed. Gas equipment was suspected to be involved
Major	8-Feb-2013	Langley	0	N/A	N/A	Fire damage	An explosion and fire occurred at an commercial premise. Although the cause was undetermined, gas equipment was suspected to be involved.
Major	13-Feb-2013	Penticton	1	Lacerations	Minor	Appliance (fireplace) and venting require replacement	A combustible mixture in a fireplace ignited and caused an explosion at a multi-family residence.
Major	27-Feb-2013	Vernon	1	Carbon monoxide (CO) exposure	Major	None	Elevated CO was reported in a single-family residence.
Major	3-Apr-2013	Campbell River	1	Bruises, abrasions	Minor	Motor home destroyed	An explosion occurred in a motor home. The owner had the propane tank filled and on the way home noticed a gas smell. The owner contacted the propane company, and they instructed the owner to soap test all joints. The motor home exploded as he was "soaping joints."
Major	22-Apr-2013	Victoria	1	Pain, laceration	Minor	Utility pole severed, shipping containers damaged	A propane explosion occurred at a commercial premise. Although the cause could not be determined, propane equipment and/or storage of propane equipment may have contributed to the cause.
Major	1-Jul-2013	Hope	0	N/A	N/A	Fire damage	A fire occurred at a recreational vehicle (RV). A propane leak at the RV's water heater is suspected to be the cause.
Major	6-Jul-2013	Vernon	0	N/A	N/A	Travel trailer destroyed; damage to adjacent vehicles	An explosion occurred in an unoccupied recreational vehicle trailer.
Major	15-Jul-2013	Surrey	1	Burns to 60% of the body	Major	Fire damage	An explosion and subsequent fire occurred at a single-family residence. A person observed a fire was coming from the propane cylinder's shut-off valve. The person was attempting to close the valve when the explosion occurred.

TABLE A-3: GAS INCIDENTS CONT'D

INCIDENT RATING	DATE	CITY	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Major	21-Jul-2013	Canoe	4	Carbon monoxide (CO) exposure	Major	None	A utility responded to a CO alarm at a single-family residence.
Major	2-Sep-2013	Parksville	0	N/A	N/A	None	Gas leak; A gas odour was reported in a storm sewer drain as a result of the gas service being in the incorrect location.
Major	11-Nov-2013	Westbank	1	Lacerations	Minor	Fireplace and venting Require replacement	An explosion occurred when a person tried to light the gas fireplace.
Minor	10-Jan-2013	Victoria	0	N/A	N/A	Main gasifier damaged	The gasification energy system at an industrial premise failed.
Minor	27-Jan-2013	Campbell River	0	N/A	N/A	Soot throughout residence	A furnace was reported to be malfunctioning after servicing.
Minor	2-Feb-2013	Victoria	0	N/A	N/A	Equipment damaged, smoke damage	A fire occurred in a dryer at a commercial premise. Gas equipment was suspected to be involved.
Minor	9-Feb-2013	Victoria	0	N/A	N/A	None	Delayed ignition occurred when a gas fireplace was turned to the main flame.
Minor	16-Feb-2013	Victoria	0	N/A	N/A	Appliance destroyed	A tankless water heater exploded and caught fire. Although the cause was undetermined, gas is suspected to be involved.
Minor	26-Feb-2013	North Vancouver	0	N/A	N/A	Gas riser sheared at the threads	While clearing snow, the equipment operator broke a 2" gas line at a union that connected the underground portion to the gas supply. The building was evacuated.
Minor	21-Mar-2013	Pemberton	0	N/A	N/A	None	A construction heater was used in a public building as temporary heat source by an untrained individual.
Minor	2-Apr-2013	Duncan	0	N/A	N/A	Smoke damage, dryer destroyed	A fire occurred in a gas dryer at a commercial premise.
Minor	14-May-2013	Victoria	0	N/A	N/A	Structure, vehicle and lamp post destroyed	A propane leak occurred when a motor vehicle collided with a frame-mounted propane tank.
Minor	22-May-2013	Surrey	0	N/A	N/A	Gas meter, gas riser broken; gas line damaged	A gas leak occurred when a motor vehicle collided with the gas meter.
Minor	30-May-2013	Surrey	0	N/A	N/A	Underground gas line damaged	An excavating contractor damaged an underground gas line when excavating a trench for a new water line. The underground gas line had not been located before excavation work started.
Minor	6-Jun-2013	West Vancouver	0	N/A	N/A	None	The utility responded to a gas leak call and detected elevated levels of CO at a residence.
Minor	26-Jun-2013	Coquitlam	0	N/A	N/A	Fire, smoke, water damage	A fire occurred at a residence. The gas system was suspected to have causal involvement.
Minor	10-Jul-2013	Kamloops	1	Burns	Minor	Smoke, heat damage	A fire involving a propane appliance occurred at a single-family residence.
Minor	24-Jul-2013	Whistler	0	N/A	N/A	Fire damage	A fire occurred at a single-family residence. Gas equipment is suspected to be involved.
Minor	21-Aug-2013	Kamloops	0	N/A	N/A	Gas meter, regulator, valve replaced	The utility reported that a water heater at a commercial premise leaked, resulting in water back-filling into gas appliances and gas piping.
Minor	14-Sep-2013	Victoria	0	N/A	N/A	Fire damage	A fire occurred above a gas fireplace in a single-family residence.
Minor	23-Sep-2013	Surrey	0	N/A	N/A	None	A gas odour was reported at a commercial premise. An unqualified person found the source of the leak and attempted to repair it but inadvertently caused the leak to increase in volume. The utility was then notified; the leak was isolated and repaired by the utility staff.
Minor	8-Oct-2013	Central Saanich	1	Lacerations requiring stitches	Minor	Equipment damaged	An explosion occurred when a gas fireplace insert experienced delayed ignition.
Minor	10-Oct-2013	Saanich	0	N/A	N/A	Equipment damaged	A fire occurred at an institutional premise. Gas was suspected to be involved.
Minor	15-Oct-2013	Saanich	0	N/A	N/A	Gas line damaged	An excavator operator damaged an underground gas line.
Minor	6-Nov-2013	Surrey	0	N/A	N/A	Equipment damaged, Fire and smoke damage	A fire occurred at a single-family residence after a boiler overheated during a power outage.
Minor	11-Nov-2013	Surrey	1	Carbon monoxide (CO) exposure	Major	None	A utility responded to a CO alarm. A malfunctioning furnace created excess CO in a single-family residence.
Minor	17-Nov-2013	Whistler	0	N/A	N/A	Gas line damaged	A tow truck damaged a suspended gas line mounted on the ceiling of an underground parkade.
Minor	29-Nov-2013	Duncan	0	N/A	N/A	Fire, smoke, water damage	A fire occurred at a single-family residence. Gas/gas equipment was suspected to be involved.
Minor	9-Dec-2013	Surrey	1	Carbon monoxide (CO) exposure	Major	Plugged heat exchanger on furnace	A utility responded to a gas odour complaint.
Minor	13-Dec-2013	Surrey	0	N/A	N/A	Defective heat exchanger	A fire department and utility responded to a CO alarm at a single-family residence.
Minor	15-Dec-2013	Surrey	3	Carbon monoxide (CO) exposure	Major	Plugged heat exchanger on boiler	Combustion products spilled into residence; the utility measured elevated CO in residence.
Minor	18-Dec-2013	Duncan	0	N/A	N/A	House piping, gas meter damaged.	A motor vehicle impacted the meter set located on the exterior of a garage.

TABLE A-3-1: LISTING OF CARBON MONOXIDE INCIDENT INVESTIGATIONS 2007-2012

INCIDENT DATE	CITY	INJURY TYPE				INCIDENT DESCRIPTION	POSSIBLE CAUSE(S), CONTRIBUTING FACTOR(S) AND DESCRIPTIONS	CAUSE CATEGORY	OCCUPANCY/ PREMISE TYPE	EQUIPMENT			
		TOTAL INJURED/ AFFECTED	FATAL INJURY	HOSPITALIZED/ HOSPITAL VISIT RECOMMENDED	NO INJURY REPORTED BUT AFFECTED/ DISPLACED					IDENTIFIED IN INVESTIGATION	SOURCE OF CO	POSSIBLE SOURCE OF CO	GAS TYPE
2-Jul-07	Vancouver	2	2	0	0	Two people died from CO exposure.	The cabin was built of tight construction with little air leakage; no combustion air brought into the cabin; refrigerator was not installed to manufacturer's recommendations.	Incorrect installation	Recreational (Cabin)	Refrigerator	Refrigerator	-	Propane
20-Apr-07	Prince	2	0	1	1	Gas utility responded to an 'odour call.'	Cracked heat exchanger and flame roll-out due to lack of maintenance.	Lack of maintenance	Residential	Furnace	Furnace	-	Natural gas
5-Oct-07	Coquitlam	2	0	2	0	Two people were taken to hospital with possible CO poisoning	The roof's rain cap on the B-vent was changed when the house was re-roofed earlier in the year. The rain cap was replaced with the incorrect type and partially blocked the B-vent. The furnace filter was the wrong size and the door of the blower compartment was partially open.	Equipment service/ replacement	Residential	Furnace	Furnace	-	Natural gas
11-Apr-07	New Westminster	None	0	0	0	An odour was reported at a condominium building; building was evacuated.	The fan belt was found to be broken, which would have caused improper venting. Combustion products could have been drawn into the makeup air in-stream and pumped into hallways. A copper sensing tube was found lying in the bottom of the switch compartment.	Component failure	Residential	Makeup air unit	Makeup air unit	-	Natural gas
17-Mar-07	Surrey	1	0	0	1	A person was exposed to CO. The person was taken to hospital but decided not to stay because there was a six hour wait; by the time the person arrived at the hospital, the person claimed he was feeling better.	Defective gas appliances and associated venting.	Equipment failure	Residential	Furnace, water heater	Furnace	Water heater	Natural gas
6-Jul-07	New Westminster	None	0	0	0	A person contacted his gas contractor after noticing dew-like condensation on the basement walls.	About six months prior, the contractor had replaced the home's hot water heater and furnace and common-vented into a masonry chimney. The contractor was not aware of the pool boiler that was located in a different area of the basement. The chimney liner that was installed to accommodate the replaced appliances (water heater and furnace) which blocked the chimney vent for the pool boiler. The boiler then spilled at the draft hood due to a blocked vent.	Vent obstructed; Combustion products unable to vent	Residential	Pool boiler	Pool boiler	-	Natural gas
18-Jul-07	Duncan	1	0	1	0	A person was taken to hospital and treated for CO poisoning.	The heat exchanger was cracked and allowed CO to enter the circulating air stream.	Component	Furnace	Furnace	Furnace	-	Natural gas
14-Dec-07	Pitt Meadows	4	0	4	0	A person and her three children were treated for CO poisoning.	The utility technician tested for CO; detected CO at the furnace.	Unable to determine cause	Residential	Furnace	-	Furnace	Natural gas
27-Nov-07	Sun Peaks	6	0	6	0	Six people were taken to hospital with CO poisoning.	The boiler's vent termination pipe was dislodged and the boiler would continue to shut down where the pipe became dislodged. The boiler would then shut-down and 'recycle itself' continuously. During start-up, the boiler was producing more than 1000ppm and decrease to 47ppm at high-fire.	Combustion	Residential	Boiler	Boiler	-	Natural gas
24-Oct-08	Charlie Lake	2	0	1	1	Two people were affected by CO.	Faulty mobile home gas furnace.	Equipment failure	Residential	Furnace	Furnace	-	Natural gas
26-Jan-08	Denman Island	1	1	0	0	A deceased person was discovered in a burned out camperized van.	It is unknown if fire was started by vehicle's electrical system, smoking materials, or operation of catalytic heater within vehicle. If heater was in use, CO poisoning/ impairment was possible, or heater could have ignited combustibles inside vehicle. It is possible the deceased was using the heater within the van and was overcome by CO and that the heater could have produced CO by operating the appliance in an enclosed space without adequate air supply. It is also possible that the heater was placed too close to combustible material and caused ignition.	Unable to determine	Camperized vehicle	Catalytic heater	-	Catalytic heater	Propane

TABLE A-3-1: LISTING OF CARBON MONOXIDE INCIDENT INVESTIGATIONS 2007-2012 CONT'D

INCIDENT DATE	CITY	INJURY TYPE				INCIDENT DESCRIPTION	POSSIBLE CAUSE(S), CONTRIBUTING FACTOR(S) AND DESCRIPTIONS	CAUSE CATEGORY	OCCUPANCY/ PREMISE TYPE	EQUIPMENT			
		TOTAL INJURED/ AFFECTED	FATAL INJURY	HOSPITALIZED /HOSPITAL VISIT RECOMMENDED	NO INJURY REPORTED BUT AFFECTED DISPLACED					IDENTIFIED IN INVESTIGATION	SOURCE OF CO	POSSIBLE SOURCE OF CO	GAS TYPE
11-Apr-08	Vancouver	None	0	0	0	A gas odour was reported to the fire department.	A tarp was temporarily installed for roof repairs. All of the B-vented appliances (gas fireplaces, boilers, make-up air units, ranges) were venting to the space below the tarp. Combustion products were trapped under the tarp where it was re-circulated by roof top equipment and heating appliances. The CO then migrated throughout the building by the hall pressurization equipment.	Combustion products unable to vent	Commercial	Fireplaces, boilers, makeup air units, ranges	Fireplaces, boilers, makeup air units, ranges	-	Natural gas
18-Jun-08	Armstrong	27	0	27	0	Twenty-seven people were taken to hospital for CO poisoning.	A "negative from the fan coil unit" caused the boiler not to vent. The amount of rust on the back of the boiler indicated the boiler had not been vented for an extended period of time.	Combustion products unable to vent	Industrial	Boiler	Boiler	-	Natural gas
29-Nov-08	Langley	2	0	2	0	Two people were treated for CO poisoning.	A gas contractor inspected the furnace and found a crack in the heat exchanger. The heat exchanger failed due to the age of the equipment and lack of service.	Lack of maintenance	Residential	Furnace	Furnace	-	Natural gas
6-Dec-08	Burnaby	None	0	0	0	The utility responded to a CO alarm call.	CO source was determined to be the roof top air handing unit. Three power-vented boilers were 20ft away on the same wall as the air handling unit; combustion products were drawn into the air intake.	Combustion products unable to vent	Residential	Roof top air handing unit	Roof top air handing unit	-	Natural gas
29-Dec-09	Kamloops	None	0	0	0	People phoned emergency services when their CO detector sounded.	The installation is over 20 years old and does not meet current code requirements. The change room had the combustion air supply blocked off to prevent cold air from freezing the water lines in the room and an interior door to the building was left open. The negative pressure in the building (house) and lack of an air supply to the room caused the back-drafting.	Combustion products unable to vent	Residential	Pool boiler	Pool boiler	-	Natural gas
27-Nov-09	Burns Lake	2	1	1	0	One person died from CO poisoning; another person was hospitalized.	An exhaust power venter was improperly installed on an existing natural gas boiler. The venter was installed by a registered gas contractor approximately two months prior to the incident; the manufacturer's instructions were not followed. Investigation revealed that the venter ran 50% of the time while the boiler was fired; otherwise, the boiler spilled combustion products into the residence.	Incorrect installation	Residential	Fireplace, boiler	Fireplace, boiler	-	Natural gas
30-Jan-09	Dawson Creek	4	0	0	4	A gas leak was reported to the fire department. Inspection revealed furnace was producing CO.	The return air had been removed and terminated within the furnace room. The return air caused the furnace to back-vent and allowed combustion products to enter the building.	Combustion products unable to vent	Commercial	Furnace	Furnace	-	Natural gas
14-Dec-09	Delta	None	0	0	0	A utility technician shut down a gas furnace after a high concentration of CO was detected.	(Not described)	Unable to determine cause	Residential	Furnace	Furnace	-	Natural gas
2-Feb-09	Merritt	5	0	0	5	Five people experienced effects of CO.	Heat exchangers on the pool boilers were plugged due to lack of maintenance. Venting was restricted and spilled from the appliances. The door was propped in an open position, allowing vent gases/ combustion products to be drawn from the mechanical room into the common pool area.	Lack of	Commercial maintenance	Pool boiler	Pool boiler	-	Natural gas
26-Oct-09	Surrey	3	0	0	3	Complaints of CO symptoms affecting three people.	A lower and upper suite was found with gas heating appliance exhaust vents not connected to the main vent. When in operation, the appliance's exhaust gases would enter the dwelling. Occupants were unaware of the unsafe condition until advised by the utility technician. Condition could have existed for five months.	Combustion products unable to vent	Residential	Hot water heater, hot water boiler	-	Hot water heater, hot water boiler	Natural gas

TABLE A-3-1: LISTING OF CARBON MONOXIDE INCIDENT INVESTIGATIONS 2007-2012 CONT'D

INCIDENT DATE	CITY	INJURY TYPE				INCIDENT DESCRIPTION	POSSIBLE CAUSE(S), CONTRIBUTING FACTOR(S) AND DESCRIPTIONS	CAUSE CATEGORY	OCCUPANCY/ PREMISE TYPE	EQUIPMENT			
		TOTAL INJURED/ AFFECTED	FATAL INJURY	HOSPITALIZED (HOSPITAL VISIT RECOMMENDED)	NO INJURY REPORTED BUT AFFECTED/ DISPLACED					IDENTIFIED IN INVESTIGATION	SOURCE OF CO	POSSIBLE SOURCE OF CO	GAS TYPE
1-Sep-08	Lumby	5	0	5	0	Five people were taken to hospital for treatment after exposure to CO.	Inspection of the premise revealed one ventless propane refrigerator and one cook-top stove. There was no combustion air into the premise; the refrigerator had not been serviced for some time. The refrigerator vent was partially plugged, the burner was not burning properly as the air shutter for the burner was not adjusted properly. There were carbon deposits on the burner and air shutter.	Lack of maintenance	Recreational (Cabin)	Refrigerator, cook top/ stove	Refrigerator	Cook top/ stove	Propane
20-Apr-10	Chemainus	1	1	0	0	A hospital test revealed that a person had an elevated CO.	The utility technician measured CO coming from the dual flame burner on a dual fuel range with a gas cook top. The dual flame burner had a glass centre. When the burner is 'on,' the flame seemed to impinge on the glass, producing CO with or without a pot or pan on it. The other three burners produced 40ppm CO on start up and reduced to negligible when warm. Owner was not using the microwave exhaust fan when using the range.	Combustion products unable to vent	Residential	Dual fuel range	Dual fuel range	-	Natural gas
15-Mar-10	Vernon	1	0	0	1	A person experienced symptoms of CO exposure.	The furnace was enclosed in a small space; no combustion air. There was a 6" hole in the return air duct close to the burner. The lack of combustion air and large opening in the return air plenum caused a negative pressure in the furnace space, causing flame rollout and incomplete combustion, and distribution of the combustion products throughout the premise.	Combustion products unable to vent	Residential	Furnace	Furnace	-	Natural gas
18-Apr-10	Prince Rupert	2	0	0	2	Two people were taken to hospital for carbon monoxide poisoning.	The vent was dislodged from the boiler.	Combustion products unable to vent	Residential	Boiler	Boiler	-	Natural gas
4-Jan-10	Prince George	1	0	0	1	A person experienced CO poisoning after CO detector alarms sounded.	Testing found that the hot water heater was spilling combustion products resulting in an elevated CO level. The hot water heater displayed evidence of corrosion and inadequate maintenance. A passive 4" combustion air source was located in the equipment room in addition to the combustion air grille located in the supply plenum of the furnace. The furnace return air ducting was reasonably tight, the filter access had no cover. No indication of backdrafting at the appliance draft hoods.	Lack of maintenance	Residential	Hot water heater, Furnace	Hot water heater	Furnace	Natural gas
19-Aug-10	Victoria	None	0	0	0	The fire department responded to an odour call and CO detector alarm call.	The gas water heater serviced three suites. The atmospheric water heater was vented into a dilapidated chimney that served the entire building. The 3" chimney vent connector was taped into the main chimney; no liner in the chimney. There was no combustion air into the common suite where the water heater was located.	Incorrect installation	Residential	Water heater	Water heater	-	Natural gas
14-Oct-10	Agassiz	1	0	0	1	Emergency services were called when a person was found unresponsive.	The appliances appeared that they have not been serviced. The masonry chimney was completely plugged where the furnace connects to the vent connector. The vent connector from the furnace was partially plugged by debris from the masonry chimney. The furnace had large rust particles from the heat exchanger laying across the burner. Its is possible that the furnace heat exchanger had holes in it.	Lack of maintenance	Residential	Furnace	Furnace	-	Natural gas

Appendix A: Incident Summaries Cont'd

TABLE A-3-1: LISTING OF CARBON MONOXIDE INCIDENT INVESTIGATIONS 2007-2012 CONT'D

INCIDENT DATE	CITY	INJURY TYPE				INCIDENT DESCRIPTION	POSSIBLE CAUSE(S), CONTRIBUTING FACTOR(S) AND DESCRIPTIONS	CAUSE CATEGORY	OCCUPANCY/ PREMISE TYPE	EQUIPMENT			
		TOTAL INJURED/ AFFECTED	FATAL INJURY	HOSPITALIZED (HOSPITAL VISIT RECOMMENDED)	NO INJURY REPORTED BUT AFFECTED/ DISPLACED					EQUIPMENT INVOLVED IN INVESTIGATION	SOURCE OF CO	POSSIBLE SOURCE OF CO	GAS TYPE
12-Dec-10	Kelowna	2	1	1	0	One person died from suspected CO poisoning. A second person was hospitalized for treatment.	The furnace fan and/or dryer put the home into a negative pressure condition which caused the fireplace B-vent to down draft. The furnace duct system in the insulation space under the premise was not tightly sealed and caused a substantial negative pressure in the home when the furnace air circulation fan was operating. The fire place appeared to be in good condition during a visual check. The fireplace was disassembled and it was noted that there was soot on the ceramic log set. The centre log had damaged retaining tabs which allowed the log to fall against the front log, restricting the flame path and causing the flame to be impinged. This caused the soot and CO.	Incorrect installation	Residential	Furnace, fireplace	Furnace, fireplace	-	Natural gas
20-Oct-10	West Vancouver	None	0	0	0	A water heater was damaged by a home made burner assembly.	A person assembled a makeshift burner to keep the water hot after the utility had plugged the fuel supply. The home-made hose and burner assembly was not secured to the water heater. The orifice was not secured to the burner and was likely to have caused severe damage and/or injuries. Pets could have dislodged the orifice, which could have caused the basement to fill with propane gas.	Intentional bypass of safety measures	Residential	Water heater, camp stove burner	Water heater, camp stove burner	-	Natural gas
25-Jan-11	Squamish	None	0	0	0	Arooftop heating unit developed corroded and plugged burners. Excessive debris accumulated in the combustion chamber.	Lack of maintenance over time caused unit deterioration to point where critical components were corroded, holes were created.	Lack of maintenance	Commercial	Roof top heating unit	Roof top heating unit	-	Natural gas
28-Mar-11	Vancouver	1	0	1	0	The utility responded to a gas odour call. A person was sent to hospital.	Venting on unit heaters had holes due to rusting. Investigation revealed that the common venting for the unit heaters did not meet code requirements.	Combustion products unable to vent	Commercial	Unit heaters	Unit heaters	-	Natural gas
17-Oct-11	Prince George	4	0	4	0	Four people experienced CO symptoms	The water heater was installed in 2008 but recently was experiencing pilot outages. The furnace's combustion blower was not tight, the exhaust vent coupler was not tightened. There appeared to be a lack of service on the water heater and lack of combustion air.	Equipment failure	Residential	Water heater, furnace	Water heater	furnace	Natural gas
30-Jan-11	Cumberland	None	0	0	0	Fire-side boiler explosion.	Flue gas analysis on boiler #2 indicated the boiler was in a poor state of air-gas ratio. The boiler was producing more than 2000ppm CO at high fire. The explosion was consistent with an off-cycle combustible explosion.	Poor air-gas ratio	Commercial	Boiler	Boiler	-	Natural gas
4-Feb-11	Dawson Creek	None	0	0	0	Combustion products entered into a home after the flue separated.	The flue collar from the flue liner separated from the base tee of the flue assembly.	Combustion products unable to vent	Residential	Furnace, hot water tank	Furnace, hot water tank	-	Natural gas
5-Dec-11	Armstrong	1	0	0	1	A person experienced CO symptoms	The utility found high levels of CO at the top heat grill to the fireplace.	Unable to determine cause	Residential	Fireplace	Fireplace	-	Natural gas
22-Dec-11	Penticton	2	0	0	2	Two people contacted the utility when their CO detector sounded.	Lack of maintenance of the furnace caused the appliance to produce high levels of CO in the flue gas. The combination of the plugged fresh air intake and the use of the wood burning appliances in the home caused a negative condition. This negative did not allow the furnace to vent properly spilling more than 300ppm of CO into the basement. The CO was circulated throughout the home causing the CO poisoning symptoms.	Lack of maintenance	Residential	Furnace	Furnace	-	Natural gas
24-Dec-11	Whalley	None	0	0	0	The utility responded to an odour call.	Short B vent height results in poor stack action which occasionally results in the products of combustion from the water heaters spilling into the mechanical room.	Combustion products unable to vent	Residential	Water heaters	Water heaters	-	Natural gas
23-Aug-11	Surrey	None	0	0	0	On advise from the utility, a person reported an incident involving the unsafe operation of a gas water heater.	Valve failed	Component failure	Residential	Water heater	Water heater	-	Natural gas

TABLE A-3-1: LISTING OF CARBON MONOXIDE INCIDENT INVESTIGATIONS 2007-2012 CONT'D

INCIDENT DATE	CITY	INJURY TYPE				INCIDENT DESCRIPTION	POSSIBLE CAUSE(S), CONTRIBUTING FACTOR(S) AND DESCRIPTIONS	CAUSE CATEGORY	OCCUPANCY/ PREMISE TYPE	EQUIPMENT			
		TOTAL INJURED/ AFFECTED	FATAL INJURY	HOSPITALIZED (HOSPITAL VISIT RECOMMENDED)	NO INJURY REPORTED BUT AFFECTED/ DISPLACED					IDENTIFIED IN INVESTIGATION	SOURCE OF CO	POSSIBLE SOURCE OF CO	GAS TYPE
7-Jan-12	Langley	None	0	0	0	The utility responded to an odour call at a residence.	The utility technician confirmed that the furnace was not venting correcting and spilling CO into the residence. Insufficient gas supply caused buildup of carbon within burner. The appliance was being supplied by gas found to be bypassing a gas meter shut-off valve.	Equipment failure	Residential	Furnace	Furnace	-	Natural gas
22-Feb-12	Kelowna	None	0	0	0	The fire department responded to a CO alarm at a residence.	It appears that an unqualified technician was working on the water heater two days prior to the incident taking place. The individual was called by the owner to repair a water leak and left the water heater running knowing that a part of the venting system was faulty / leaking. The individual intended to let the water heater running until the part came in which created an unsafe situation.	Regulated work by unqualified person	Residential	Water heater	-	Water heater	Natural gas
17-Mar-12	Mission	None	0	0	0	The utility responded to an odour call.	Plugged vent connector; The furnace draft hood outlet was found plugged with fibreglass insulation. The person advised the GSO that a new microwave and exhaust fan was installed. The B-vent (located above the furnace) appeared that it had been relocated from its original location. A 'ball' of fibreglass insulation was found in the vent connector. It is possible that the previous owner plugged the connector to prevent renovation debris from entering the furnace when it was moved, and had forgotten to remove the debris.	Vent obstructed; Combustion products unable to vent	Residential	Furnace	-	Furnace	Natural gas
7-Feb-12	Langley	5	0	5	0	People felt ill in their home and contacted emergency services.	Type-B vent termination cap corroded and collapsed onto the vent pipe, causing flue blockage and spillage of combustion products to spill into the residence.	Vent obstructed; Combustion products unable to vent	Residential	Boiler, water heater	-	Boiler, water heater	Natural gas
1-May-12	Osoyoos	1	0	1	0	A person was sent to hospital for CO exposure.	Appliance installed with non-compliant venting and air requirements.	Incorrect installation	Residential	Furnace	-	Furnace	Natural gas
25-Jul-12	Salmo	3	0	1	0	Three people were treated at hospital for CO exposure.	It was not determined why the furnace was producing CO. The vent and chimney were clear; combustion products were spilling from the draft diverter. The furnace condition was poor; the heat exchanger appeared to be corroded. Cracks in the heat exchanger were present.	Unable to determine cause	Residential	Furnace	Furnace	-	Natural gas
29-Aug-12	Nelson	None	0	0	0	The utility responded to a CO alarm at a residence.	"Water heater over-fired"; "The home is at the base of a mountain there were high winds and a cool down draft coming off the mountain, coupled with tall cedar trees surrounding this home providing a high probability of a down draft at the gas vent. I suspect that the down drafting caused the products of combustions to spill into the home."	Wind created down-draft	Residential	Water heater	Water heater	-	Natural gas
20-Oct-12	Smithers	None	0	0	0	The utility responded to an odour call.	Venting was not finished was not per regulation. The B vent was not insulated and framed per regulation. Also, the boiler could not vent properly because the hot water tank was replaced with an electric tank which "compounded the stack action."	Appliance venting "was not finished per regulation.	Residential	Boiler	Boiler	-	Natural gas
24-Oct-12	Vancouver	None	0	0	0	The utility responded to an odour call.	The exhaust fan was not working properly.	Equipment not operating	Commercial	Stock pot	Stock pot	-	Natural gas
31-Oct-12	Abbotsford	None	0	0	5	People were exposed to CO.	Unqualified, not knowledgeable person performing regulated work.	Regulated work by unqualified person	Residential	Furnace	Furnace	-	Natural gas

TABLE A-3-1: LISTING OF CARBON MONOXIDE INCIDENT INVESTIGATIONS 2007-2012 CONT'D

INCIDENT DATE	CITY	INJURY TYPE				INCIDENT DESCRIPTION	POSSIBLE CAUSE(S), CONTRIBUTING FACTOR(S) AND DESCRIPTIONS	CAUSE CATEGORY	OCCUPANCY/ PREMISE TYPE	EQUIPMENT			
		TOTAL INJURED/ AFFECTED	FATAL INJURY	HOSPITALIZED /HOSPITAL VISIT RECOMMENDED	NO INJURY REPORTED BUT AFFECTED DISPLACED					IDENTIFIED IN INVESTIGATION	SOURCE OF CO	POSSIBLE SOURCE OF CO	GAS TYPE
29-Nov-12	West Vancouver	None	0	0	0	An exhaust vent had dislodged, allowing combustion products to be vented into the residence.	Pipe connection dislodged due to the sealant failing to adhere the plastic. The venting was well supported, and there is evidence that both the recommended primer and adhesive was used. It is possible that the elbow was impacted by a person or thing in the area leading to the disconnection. It is also possible the adhesives were subject to some kind of contamination or compromise at the time of application that allowed them to fail (such as moisture, grease, or oil), although none of this was evident at the time of inspection.	Venting pipe connection dislodged	Residential	Water heater, furnace	Water heater, furnace	-	Natural gas
3-Jan-09	Surrey	None	0	0	0	A person awoke to find his residence filling with smoke. Although it was determined that the smoke originated from combustible debris left in the furnace, further investigation identified several performance issues with the furnace.	The installer failed to remove the paper or cardboard at the furnace warm air plenum. The installer was not a qualified fitter and the contractor was not licensed.	Regulated work by unqualified person	Residential	furnace	furnace	-	Natural gas

Appendix A: Incident Summaries Cont'd

TABLE A-4: ELEVATING DEVICES INCIDENTS

INCIDENT RATING	DATE	CITY	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Severe	17-Sep-2013	Vancouver	0	N/A	N/A	None	Malfunction of reset portion of control relay causing a back feed of power to hall and car door locks.
Severe	29-Sep-2013	Vancouver	1	Laceration	Minor	Light fixture damaged	A light fixture fell from a ceiling cab and contacted a passenger.
Major	16-Jan-2013	Vancouver	1	Broken jaw, lacerations	Major	Broken chains	A twin-post elevator malfunctioned and caused the elevator to freefall approximately 16'.
Major	13-Apr-2013	Vancouver	2	"head injuries"	Minor	None	A passenger and his luggage fell down the escalator, hit a second passenger who also fell.
Major	21-Apr-2013	Surrey	1	"head injuries", transported to hospital	Major	None	A passenger sat on the escalator hand rail, sliding down on the 'up' escalator. The passenger fell approximately 30 feet backwards onto the street/sidewalk below.
Major	24-Apr-2013	Vancouver	1	Pain	Minor	None	It was reported that a passenger was stepping into the elevator, the elevator shot up several feet.
Major	22-Aug-2013	Surrey	1	(not specified)	Minor	None	A passenger tripped as she was running up the escalator.
Major	22-Oct-2013	Richmond	1	Chipped tooth, laceration	Minor	None	A passenger was walking up the escalator. He missed a step and fell forward.
Major	30-Dec-2013	Vancouver	1	Laceration	Minor	None	A passenger took a grocery cart onto an escalator.
Minor	22-Jan-2013	Burnaby	0	N/A	N/A	None	The elevator was out of level, outside doors were not opening.
Minor	23-Jan-2013	Burnaby	1	Pain, bruises	Minor	None	A passenger slipped and fell on an escalator.
Minor	1-Feb-2013	Vancouver	1	Possible head injury	Minor	None	A passenger fell on an escalator.
Minor	4-Feb-2013	Vancouver	0	N/A	N/A	None	A passenger's boot became caught in the escalator.
Minor	23-Feb-2013	Richmond	1	Passenger hit head on combplate	Minor	None	A passenger fell on an escalator.
Minor	24-Feb-2013	Vancouver	0	N/A	N/A	None	Two passengers were entrapped in an elevator when the elevator stopped between floors. The elevator was approx 36" above the hall sill level.
Minor	13-Mar-2013	Vancouver	0	N/A	N/A	None	A passenger fell on an escalator.
Minor	14-Mar-2013	Nanaimo	1	Bruises	Minor	None	A passenger tripped over the bi-parting door as she exited the elevator.
Minor	26-Mar-2013	Victoria	1	Electrical shock	Minor	None	A passenger reported receiving an electrical shock from contacting the car operating panel buttons.
Minor	26-Mar-2013	Victoria	1	Pain	Minor	None	A passenger reported that the elevator door closed on her hand.
Minor	12-Apr-2013	Vancouver	1	Unknown	Minor	None	A passenger fell on an escalator.
Minor	16-Apr-2013	Victoria	1	Pain	Minor	None	A passenger pushed a shopping card onto an escalator. The cart went down the escalator (uncontrolled) and contacted a passenger.
Minor	24-Apr-2013	Victoria	1	Pain, laceration	Minor	None	A passenger fell at the escalator's lower landing.
Minor	11-May-2013	Vancouver	0	N/A	N/A	None	A passenger was entrapped in an elevator near the top landing.
Minor	22-May-2013	Vancouver	0	N/A	N/A	None	The fire department reported a mislabelled elevator.
Minor	23-May-2013	Vancouver	1	"head injury"	Minor	None	A passenger stepped onto an escalator, pulling his suitcases behind him. As the steps began to rise, the passenger was pulled backwards by his luggage and fell.
Minor	27-May-2013	Prince George	1	Not specified	Minor	None	An elevator door closed on a passenger's hand.
Minor	25-Jun-2013	Vancouver	1	(Not specified)	Minor	None	A passenger's boot lodged into the side skirt lower end.
Minor	27-Jun-2013	Burnaby	0	N/A	N/A	None	A passenger's rubber boot entered the step-skirt area of the escalator.
Minor	7-Jul-2013	Burnaby	1	Pain	Minor	None	A passenger's hand was caught between the car door and jamb.
Minor	16-Jul-2013	Richmond	1	Pain/laceration	Minor	None	A passenger was walking up an escalator and missed a step, causing her to hit her knee.
Minor	17-Sep-2013	Prince George	0	N/A	N/A	None	"Improper jumper; employees not being made aware of 'jumped-out doors' and safety gear while working on unit."
Minor	26-Sep-2013	Surrey	1	(Not specified)	Minor	None	A passenger fell.
Minor	14-Oct-2013	Vancouver	1	(Not specified)	Minor	None	A passenger sat on the escalator steps. When he tried to stand up at the bottom platform, the passenger fell and his jacket was pulled into the comb teeth.
Minor	17-Oct-2013	Burnaby	1	4mm avulsion, bruising	Minor	None	A passenger's hand was caught between the car door and elevator door frame.
Minor	19-Oct-2013	Burnaby	1	(Not specified)	Minor	None	A passenger fell backwards on an escalator.
Minor	20-Oct-2013	Burnaby	1	Abrasion	Minor	None	A passenger's hand was stuck between the door and door frame as the door was opening.
Minor	21-Oct-2013	Burnaby	1	Swelling, lacerations	Minor	None	A passenger's caught her foot on a step.

Appendix A: Incident Summaries Cont'd

TABLE A-4: ELEVATING DEVICES INCIDENTS CONT'D

INCIDENT RATING	DATE	CITY	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Minor	18-Nov-2013	Nanaimo	1	Pain	Minor	None	A passenger on an escalator lost her balance and fell.
Minor	25-Nov-2013	Prince George	0	N/A	N/A	Components damaged from water and urine contamination	Water and urine contaminated the elevator machine break and caused unintended movement of the elevator. The elevator was stopped by the rope gripper.
Minor	27-Nov-2013	Saanich	1	Pain, bruises	Minor	None	A passenger tripped and fell at the escalator landing.
Minor	29-Nov-2013	Prince George	1	Bruises	Minor	None	A passenger fell on an escalator.
Minor	9-Dec-2013	Surrey	1	Laceration	Minor	None	A passenger's fingers were caught in the car door.
Minor	13-Dec-2013	Victoria	1	Exasperated injured leg	Minor	None	A person was slow to exit the elevator; it is possible that the elevator doors went into 'nudging' and hit her leg.
Minor	14-Dec-2013	Clearbrook	1	Laceration, bruises	Minor	None	A passenger fell at the top landing of an escalator.
Minor	16-Dec-2013	Burnaby	1	(Not specified)	Minor	None	A passenger fell on an escalator.
Minor	20-Dec-2013	Burnaby	1	Abrasion	Minor	None	A passenger fell on an escalator.
Minor	24-Dec-2013	Victoria	1	Laceration	Minor	None	A passenger slipped and fell on an escalator.
Minor	31-Dec-2013	Burnaby	1	Possible muscle strain	Minor	None	The elevator door closed on a passenger's hand.

Appendix A: Incident Summaries Cont'd

Table A-5 is sorted by Date.

TABLE A-5: RAILWAY ACCIDENTS AND INCIDENTS

RAILWAY CLASS	DATE	ACCIDENT OR INCIDENT	DANGEROUS GOODS	INJURY OR FATALITY	DESCRIPTION	RISK
Industrial	January 4, 2013	Accident	No	No	Pulp Car Derailed 1-truck (Split a Switch) , no reported injuries.	Low
Industrial	January 6, 2013	Accident	No	No	Pulled a chip car up off its trucks in the dumper	Low
Industrial	January 4, 2013	Accident	No	No	One car walked up on spilled coal and derailed.	Low
Industrial	January 9, 2013	Accident	No	No	Soap car derailed 1-truck (snow & ice buildup) no reported injuries.	Low
Common Carrier	January 8, 2013	Accident	No	Minor Injury	Conductors hand was cut by metal banding hanging off flat car.	Low
Industrial	January 16, 2013	Accident	No	No	When backing train up, loader came into contact with railcar and damaged the sill on the rail car.	Med
Industrial	January 9, 2013	Accident	No	No	When using spare car mover, with no air, misjudged braking and ran through switch.	Low
Industrial	January 16, 2013	Accident	No	No	Car mover walked up on ice and derailed.	Low
Industrial	January 14, 2013	Accident	No	No	Trackmobile Operator overshot derail and pushed front wheels onto derail.	Low
Common Carrier	January 27, 2013	Accident	No	No	Pushing into customer spur with 3 locomotives and 2 loaded cars, leading truck of leading car derailed at the inside switch on the customer spur.	Low
Industrial	February 1, 2013	Accident	No	No	Load out operator instructed engineman to push back when loading chute was still lowered, causing car to collide with chute, damaging both rail car and chute.	Low
Common Carrier	February 8, 2013	Accident	No	No	When switching yard, crew cut off 7 cars. Cars rolled away and hit derail. 2 of the 7 cars derailed.	Med
Common Carrier	February 1, 2013	Accident	No	No	Crew ran through switch when making a series of moves over switch.	Low
Common Carrier	February 16, 2013	Accident	No	No	Rear compartment of locomotive caught fire when starting engine.	Low
Industrial	February 15, 2013	Accident	No	No	One car derailment due to build up of ice and snow.	Low
Industrial	February 18, 2013	Accident	Yes	No	One car derailment due to build of ice and snow 200 feet south of yard crossing.	Low
Industrial	February 20, 2013	Accident	No	No	Car derailed when pulling out of shed, rail rolled under car.	Low
Common Carrier	February 25 2013	Accident	No	No	Yard crew did not line both cross over switches, ran through switch. CROR violation.	Med
Industrial	February 27, 2013	Accident	No	No	Log car walked up on ice built up on track and derailed.	Low
Common Carrier	February 28, 2013	Accident	No	Minor Injury	Trainman rolled ankle when detraining off stationary equipment and suffered a minor injury.	Low
Industrial	March 2, 2013	Accident	No	No	Coal cars were being loaded with front end loader and coal was being discharge over the side of the car. The loader operator did not see the coal piling up and as a result six cars derailed.	Low
Industrial	March 4, 2013	Accident	No	No	When service provider was pulling rail cars from warehouse, employee pushed button to close warehouse door. Door came down on moving railcar damaging door.	Low
Industrial	March 8, 2013	Accident	No	No	Crew left switch lined against their movement and ran though it.	Low
Industrial	March 28, 2013	Accident	No	No	Pushing empty 15 empty cars, derailed shuttle wagon over frog.	Low
Industrial	March 30, 2013	Accident	No	No	Pulling loaded car from loading rack, ran over derail with shuttle wagon derailing shuttle wagon.	Med
Industrial	March 28, 2013	Accident	No	No	When spotting lumber cars, crew pushed back too far, hitting stop block and damaged knuckle.	Low
Common Carrier	April 7, 2013	Accident	No	No	Crew tied onto five empties that were on the customers track. When they started to pull, conductor noticed one car had derailed, possibly rode up on spilled product.	Low
Common Carrier	April 13, 2013	Accident	No	No	When pulling out of yard track, crew heard loud bang. When crew investigated they found a rolled rail and one car that had come off and re-railed itself.	Low
Common Carrier	April 16, 2013	Accident	No	No	Derailed two loaded cars pulling out of Insulspan on Annacis Island. Rail spread under cars.	Low
Common Carrier	March 17, 2013	Accident	No	No	When pushing into yard track past a close clearance rail car, lead locomotive contacted cars with rail shield on engine. Speed was approx 1 mph due to observed close clearance.	Low
Industrial	March 31, 2013	Accident	No	No	Chute was left open, spilling coal. When crew started up again two cars walked up on spilled coal and derailed.	Low

TABLE A-5: RAILWAY ACCIDENTS AND INCIDENTS CONT'D

RAILWAY CLASS	DATE	ACCIDENT OR INCIDENT	DANGEROUS GOODS	INJURY OR FATALITY	DESCRIPTION	RISK
Industrial	April 25, 2013	Accident	No	No	Derailed shuttle wagon as a result of being unable to stop. Hydraulic fluid had been accidently drained prior to incident.	Low
Common Carrier	April 23, 2013	Accident	No	No	SRY derailed one loaded auto rack in customer trackage (Allied) Appears wheel on car picked the switch points, thin flange on wheel.	Low
Common Carrier	April 26, 2013	Accident	No	No	two units derailed when pulling out of Spur. Rail spread under units.	Low
Common Carrier	April 1, 2013	Accident	No	No	While pulling empty cars, empty sodium oxide car picked the point ofthe 3 way switch on the barge deck, derailing one axle travelling approx 2 feet from point of derailment. The transition rail on the barge deck was deemed the cause of the derailment. The speed at the time of the derailment was 1 2 MPH	Low
Common Carrier	April 16, 2013	Accident	No	No	While attempting to make a coupling on a cut of cars, the trainman and trainman trainee were giving the locomotive instructions towards the coupling, as the movement approached the coupling appropriate instructions were given, however the engineer controlling the movement failed to stop the movement in accordance to the instructions given by the crew members.	Low
Common Carrier	April 21, 2013	Accident	No	Minor Injury	The employee made a coupling, and advised the engineer to go ahead. As the cars started to roll the employee heard an odd noise, and started to walk towards the cars to see what was making the noise. The employee thought he saw a broken rail or angle bar and moved in for a closer look. A tank car was now rolling by and the employee could lean in a little further, so as he leaned in and the loading ladder of the tank car struck him on the top of his head launching him to the ground. The employee was driven to the hospital and treated.	Med
Common Carrier	April 22, 2013	Accident	No	No	While attempting to make a coupling on a cut of cars, the trainman and trainman trainee was giving the locomotive instructions towards the coupling, as the movement approached the coupling appropriate instructions were given, however the engineer controlling the movement failed to stop the movement in accordance to the instructions given by the crew members.	Low
Industrial	May 1,2013	Accident	No	No	The coal sluffed down onto the track while the train was being loaded and caused five cars to derail.	Low
Common Carrier	May 4, 2013	Accident	No	No	Long drawbar marshalled next to short drawbar next to engines caused car to walk off on wide gauge.	Med
Commuter	April 27, 2013	Accident	No	Minor Injury	Intrusion at Station. Control room closed both inbound and outbound tracks at station. Three trains emergency braked. Female reported with head and leg injuries	Med
Heritage	January 2, 2013	Accident	No	No	Engine walked up on ice and derailed when moving through crossing.	Low
Common Carrier	May 27, 2013	Accident	No	No	Switcher crew pushing into Evraz customer track in Newton, derailed one loaded car on curve, wide gauge.	Low
Industrial	May 30,2013	Accident	No	No	Trackmobile made contact with side of stationary car. Trackmobile was traveling down rail right after heavy rainstorm. Went to stop as he approached the car and slid into the side of the car. No reported injuries reported.	Med
Common Carrier	May 16, 2013	Accident	No	No	2 loads and 2 empties derailed when pulling out of yard track. 100 feet of track damage including two switches.	Low
Commuter	May 18, 2013	Accident	No	Minor Injury	Patron fell on train when train emergency braked.	Low
Commuter	May 20, 2013	Accident	No	Minor Injury	Patron fell backwards and bumped head when train emergency braked leaving station.	Low
Common Carrier	June 7, 2013	Accident	No	No	Pushing into South end yard Marpole Spur, run thru switch and derailed one car.	Med
Industrial	June 8, 2013	Accident	No	No	Crew pushing one empty car, ran through switch. Track P2 switch 2.	Med
Heritage	June 8, 2013	Accident	No	Minor Injury	Locomotive was exiting the switchloop and it derailed (All 4 Wheels on the ground) Minor injury with first aid administered for bleeding nose. Incident is currently under investigation as to the cause but initial reports show the engineer had too much speed entering the switch and the locomotive jumped off the track. The train entered the switch at approximately 8 km/hr . The track was checked immediately for defects with nothing found to be out of specifications as per the TSR.	High
Industrial	June 11, 2013	Accident	No	No	When pulling loads, conductor threw derail under last car causing the last axle to derail.	Med
Commuter	June 6th, 2013	Accident	No	No	Rear window fell out of Train 117 as it was travelling inbound to Langara station, just inside the cut-and-cover portal. Upon investigation the windshield was found to be improperly installed resulting in insufficient adhesion between the glass and the window frame No injuries sustained	High
Common Carrier	June 13, 2013	Accident	No	No	Pushing 21 empty auto carriers, train picked the points on a switch derailing two wheels on the A end of railcar. No reported injuries.	Low
Industrial	June 17, 2013	Accident	No	No	Training new trackmobile operator, ran over derail with trackmobile.	Low

TABLE A-5: RAILWAY ACCIDENTS AND INCIDENTS CONT'D

RAILWAY CLASS	DATE	ACCIDENT OR INCIDENT	DANGEROUS GOODS	INJURY OR FATALITY	DESCRIPTION	RISK
Common Carrier	July 2, 2013	Accident	No	No	Crew bypassed knuckle and did not realize it, pulled on cars and derailed one empty box car - B end trucks.	Low
Common Carrier	July 4, 2013	Accident	No	No	Crew had a hold of 2 loaded steel cars and was backing up to pick up 2 more when the second wheel on the first set of trucks on locomotive derailed at the switch. No reported injuries.	Med
Industrial	July 14, 2013	Accident	No	No	Trackmobile operator realized he was going down wrong track, slide to a stop half way thru switch due to wet conditions. Backed up not realizing it was a spring switch and split switch derailing one car.	Med
Industrial	July 15, 2013	Accident	No	No	Unloading concentrate car with excavator working near the track when the north set of wheels went on the ground. Rail rolled under car due to excavator digging too near track.	Med
Industrial	June 4, 2013	Accident	No	No	While loading a coal train, coal fell into the exhaust stack of a CPR locomotive incapacitating the locomotive.	Low
Common Carrier	July 18, 2013	Accident	No	No	After relieving the night crew, the day crew picked up 24 cars on route. After coupling their train together and pulling back the crew noticed that 2 hand brakes were not removed from the railcars that were picked. A mechanical inspection was performed and all 4 axles on both railcars need to be changed out.	Med
Commuter	July 17, 2013	Accident	No	No	Car derailed in yard track at OMC, split switch due to worn switch point and stock rail.	Low
Common Carrier	July 21, 2913	Accident	No	No	Crew was pushing to joint with 3770 feet of loaded container traffic. After making joint they found that they had derailed the west truck on DTTX 721137.	Low
Common Carrier	July 22, 2013	Accident	No	No	Switcher pulling 28 loaded cars reported derailing two three pack intermodal cars at switch. Cars DTTX725205 and DTTX724809 had three trucks derailed. Damage to cars and track structure being assessed. Spring switch malfunction.	Low
Heritage	July 20, 2013	Accident	No	No	Engineman applied brakes too late and engine hit stop block hard, damaging stop block.	Low
Siding & Spur	July 29, 2013	Accident	No	No	Load Out operator in training was changing from #4 CC Silo to #2 CC Silo and did not raise the chute all the way up. The chute made contact with the top of the engine 9682 communication equipment covers. No reported injuries.	Low
Common Carrier	August 3, 2013	Accident	No	No	Eng 121-122 was pulling 4 loaded auto racks and 38 empty auto racks when 1 set of trucks on the A end of an empty Bi level car derailed in Annacis Yard Track 4. No reported injuries.	Low
Common Carrier	August 2, 2013	Accident	No	No	Two cars derailed when pulling 27 empties. Derailed cars struck an engine that was parked on an adjacent track.	Med
Common Carrier	August 10, 2013	Accident	No	No	Crew was pushing 31 empty auto racks and the railcar climbed the switch points. The railcar derailed and rerailed which pulled TTGX 911467 completely off all trucks. TTGX 911467 was the 21st car. No reported injuries.	Med
Industrial	July 19, 2013	Accident	Yes	No	When pushing cars, one car walked up on rail and derailed account improperly installed compromise bar.	Med
Commuter	August 22, 2013	Accident	No	Minor Injury	Train emergency braked and passenger fell in train.	Low
Commuter	August 23, 2013	Accident	No	Minor Injury	Train emergency braked and female fell into glass divider injuring elbows, knee and back.	Low
Industrial	August 15, 2013	Accident	No	No	Pushing cars into the chemical track the train struck a pick up truck parked too close to the track. No reported injuries.	Low
Industrial	August 8, 2013	Accident	No	No	Crew pushed one car over the derail.	Low
Heritage	August 24, 2013	Incident	No	No	FVHS Street Car ran through SRY foreman's limits entering SRY track at Pratt from the Cloverdale Industrial Lead.	High
Industrial	August 29, 2013	Accident	No	No	First car placed too close to derail, additional cars coupled to the car pushed it over derail.	Low
Industrial	September 9, 2013	Accident	No	No	Second car derailed when pushing six chip cars. Knuckles between 2nd and 3rd cars were bypassed causing the derailment. No reported injuries.	Low
Siding & Spur	September 16, 2013	Accident	No	No	CP units pace setters were surging, units came to a stop and coal spilled onto the tracks, when the units started again a car derailed over the coal build up.	Low
Industrial	September 3, 2013	Accident	Yes	No	On designate crossover, empty 50% sodium hydroxide car leading truck derailed after the switch heel block and was dragged 6 car lengths.	Med
Industrial	September 5, 2013	Accident	No	No	Pushing 4 cars east through chlorate unloading facility when lead car's front wheels derailed. Railcar struck the one car stop that was in the up position and the front wheel came off the track.	Med
Heritage	September 13, 2013	Accident	No	No	Upon transition southbound from the lead track to the turntable, the maintrack rails moved slightly under the weight of the locomotive, thus the rear two wheels of the locomotive rode up onto the turntable rail and derailed about 2 meters from the turntable access point.	Low

Appendix A: Incident Summaries Cont'd

TABLE A-5: RAILWAY ACCIDENTS AND INCIDENTS CONT'D

RAILWAY CLASS	DATE	ACCIDENT OR INCIDENT	DANGEROUS GOODS	INJURY OR FATALITY	DESCRIPTION	RISK
Industrial	September 14, 2013	Accident	No	Minor Injury	Track mobile struck car parked foul of crossover. Operator was checked by physician and returned to work	Med
Common Carrier	September 13, 2013	Incident	No	Minor Injury	Conductor rolled left ankle when detraining stationary caboose in siding. Conductor was later taken to hospital for discomfort in ankle. Low Common Carrier September 13, 2013 Accident No No Crew let caboose and 2 cars run free, a by passed knuckle event occurred causing damage to caboose.	Low
Common Carrier	September 18, 2013	Accident	No	No	When running around cut of cars at barge ramp, trainman lined crossover switch against direction of movement and gave signal to move through switch.	Low
Common Carrier	September 18, 2013	Accident	No	No	When switching customers track, the movement travelled over crossing and derailed over broken rail in crossing.	Low
Industrial	September 20, 2013	Accident	No	No	Derailed 2 wheels on box car when travelling over switch points.	Low
Common Carrier	September 24, 2013	Accident	No	No	Rules violation. Crew pushed train over foreman's red flag.	High
Common Carrier	September 26, 2013	Accident	No	No	Eng 911-910 was pulling 10 cars and engine 911 derailed lead wheels just past the AJ Forsyth crossing. No reported injuries.	Low
Common Carrier	September 27, 2013	Accident	No	No	When pulling 11 auto racks from client, the 8th car had two wheels derail.	Low
Common Carrier	September 30, 2013	Accident	No	No	2 empty cars derailed when pushing 13 cars into yard track.	Low
Industrial	September 25, 2013	Accident	No	No	Track unit with tool car was travelling thru spur switch when tool cars wheel hit the frog point causing the wheels to derail and fall off	Med
Common Carrier	October 2, 2013	Accident	No	No	Crew had a hold of 13 loads and 1 empty car. Crew pulled clear of switch then started to push when a railcar derailed. Four wheels on the 'A' end derailed. No reported injuries.	Low
Commuter	September 29, 2013	Incident	No	No	Speeder, coming to assist work crew, failed to stop and slid into area where workers were in guideway.	High
Industrial	October 4, 2013	Accident	No	No	When loading train, engine walked up on spilled coal and derailed.	Low
Industrial	October 11, 2013	Accident	No	No	Uncoupled rail car rolled towards spur 42 stop until it jumped the stop and derailed into the gravel. Uncontrolled movement. No reported injuries.	High
Industrial	October 11, 2013	Accident	No	No	The shuttle wagon operator was driving north on P1 to get empties and did not see that a derail was in the derailing position. The operator drove over the derail causing a derailment of the shuttle wagon. No reported injuries.	Low
Industrial	October 9, 2013	Accident	No	No	Rail crew thought they had cleared a spring switch but it appears they were not clear. A chip car split the switch resulting in 1 truck derailment. No reported injuries.	Low
Industrial	October 20, 2013	Accident	No	No	When pulling string of loaded chip cars, consist came apart over spring switch, crew put train back together again they noticed one set of wheels went down wrong track and derailed.	Med
Industrial	October 18, 2013	Accident	No	No	Personnel were attempting to position two box cars between the crossing and a derail and they inadvertently contacted the derail with the north end car wheels derailing 1 set of trucks. No reported injuries.	Low
Industrial	October 28, 2013	Accident	No	No	Brakeman released air on empty bulkhead flat, the handbrake was not applied and car rolled uncontrolled and hit derailer and derailed.	High
Industrial	October 30, 2013	Accident	No	No	Trackmobile hooked onto car and for traction control lifted car, but lifted too high. Car did not have a centre pin and wheels came out from under car.	Low
Industrial	October 30, 2013	Accident	No	No	Running with old trackmobile to make joint on 10 empties, throttle linkage came undone on track mobile. Put unit into emergency but slid into empty cars, hard joint caused damage to track mobile.	Low
Industrial	October 29, 2013	Accident	No	No	Pulling loaded cars through run around curve, front axle of trackmobile derailed. No damage. Closed on Jan 21, 2014 after sending non compliance for not submitting Part B.	Low
Industrial	November 6, 2013	Accident	No	No	Loaded chip car derailed due to build up of chips in the flange.	Low
Siding & Spur	November 13, 2013	Accident	No	No	One car derailed when it walked up on built up coal	Low
Industrial	November 12, 2013	Accident	No	No	Crew was moving empty flats with an uncoupled forklift. When they released the air cars rolled 1800 feet uncontrolled and struck two loaded cars, pushing them across north crossing.	High
Common Carrier	November 24, 2013	Incident	No	No	BNSF train was backed onto the Port Subdivision and told to stop their Head End clear of Mile 6.36 (131a St Crossing). This train was 6,823 feet in length, the distance between Mile 6.36 and Signal No 46 at Mud Bay East is 9,240 feet. This movement proceeded past a Red Signal at Signal No 46 No reported injuries	High
Industrial	November 22, 2013	Incident	Yes	No	CN was moving a string of cars and noticed a sodium chlorate car was leaking. Small amount of product leaked onto the ballast.	Med

Appendix A: Incident Summaries Cont'd

TABLE A-5: RAILWAY ACCIDENTS AND INCIDENTS CONT'D

RAILWAY CLASS	DATE	ACCIDENT OR INCIDENT	DANGEROUS GOODS	INJURY OR FATALITY	DESCRIPTION	RISK
Common Carrier	November 29, 2013	Accident	No	No	When putting train together, derailed the three last cars on last part of cut when pulling over switch.	Low
Industrial	December 3, 2013	Accident	No	No	One truck derailed on empty chip due to icy track conditions. No reported injuries.	Low
Industrial	December 1, 2013	Accident	No	No	Operator had rubber tires down for traction when pulling cars with track mobile. The rail wheels derailed when they went through switch.	Low
Siding & Spur	December 7, 2013	Accident	No	No	Derailed one coal car while loading train, build up of ice and coal caused the derailment which occurred under the loading chute.	Low
Common Carrier	December 10, 2013	Accident	No	No	Switcher was backing up lite engine into a customers track when engine derailed on switch.	Low
Industrial	December 13, 2013	Accident	No	No Pulp	Car Derailment over switch 1, no injuries, minor track and switch damage.	Low
Industrial	December 14, 2013	Incident	No	No	Air brakes on railcars did not dynamite when air was dumped by trackmobile. Car ran through switch onto derail track. Trackmobile was building air as designed and cars gear worked but brakes did not engage. Uncontrolled movement.	High
Industrial	December 16, 2013	Accident	No	No	Shunting 6 loaded lumber cars from the loading spur to the holding spur. The switch was not set in the proper position and the cars proceeded onto the CN siding and hit the derail. The lead car was derailed and due to the adjacent ground slope it caused the car to tip on its side. The CN mainline was not affected.	High
Industrial	December 21, 2013	Accident	Yes	No	North axle of north truck on empty sulphuric acid car derailed at switch points. No damage.	Low
Industrial	December 31, 2013	Accident	No	No	Engine, caboose and one pulp car derailed when service provider was pulling out of yard. Derailment caused by wide gauge.	Low
Commuter	December 15, 2013	Accident	No	Minor	Injury Female passenger reinjured back when train emergency braked.	Low
Commuter	December 16, 2013	Accident	No	Minor Injury	Two people were injured when train went into emergency.	Low
Commuter	December 30, 2013	Accident	No	Minor Injury	Two people were injured when train went into emergency. One passenger had to be removed from train by ambluance crew.	Low

TABLE A-6: PASSENGER ROPEWAYS INCIDENTS

INCIDENT RATING	DATE	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Major	19-Jan-2013	1	Possible fracture	Major	None	A passenger fell on the ramp after unload.
Major	23-Mar-2013	1	Possible fractured hip or femur	Major	None	A passenger was struck by the carrier and fell on the unload ramp.
Minor	2-Jan-2013	1	Torn ligament and fracture	Major	None	A passenger's skis became entangled with another passenger's equipment while unloading from the T-bar.
Minor	3-Jan-2013	0	N/A	N/A	None	Tower deroped, haul rope was retained by the catcher.
Minor	3-Jan-2013	0	N/A	N/A	None	A passenger fell approximately six metres from a carrier.
Minor	3-Jan-2013	0	N/A	N/A	None	A carrier struck the tower sheave equipment, causing a deropement.
Minor	4-Jan-2013	0	N/A	N/A	Break fork assembly damaged	Tower deropement retained by the inside guide.
Minor	5-Jan-2013	1	Ankle injury	Minor	None	A passenger fell on the unload ramp while unloading from a chairlift.
Minor	5-Jan-2013	0	N/A	N/A	None	Deropement; haul rope was retained by the catcher.
Minor	5-Jan-2013	0	N/A	N/A	Broken tee rope	Deropement; rope was not retained by the rope catcher.
Minor	7-Jan-2013	1	Whiplash, concussion	Major	None	A passenger fell from carrier in the loading area.
Minor	12-Jan-2013	0	N/A	N/A	None	A lift was evacuated with the evacuation drive due to a safety circuit fault.
Minor	12-Jan-2013	1	Knee injury	Minor	None	Two passengers fell after their skis became entangled while unloading.
Minor	13-Jan-2013	0	N/A	N/A	None	Tower deroped, haul rope was retained by the catcher.
Minor	13-Jan-2013	1	Pain in left shoulder	Minor	None	A late-loading passenger was struck by the closing load gate and fell onto the loading ramp surface. The passenger was then struck by a moving carrier.
Minor	15-Jan-2013	1	Possible dislocated shoulder	Major	None	A passenger fell on the unload ramp while unloading from a chairlift.
Minor	15-Jan-2013	0	N/A	N/A	Component damaged	Ropeway stopped due to the loss of tensioning force when the hydraulic tensioning ram broke at the threaded end of the rod.
Minor	18-Jan-2013	0	N/A	N/A	None	A lift was evacuated with the evacuation drive.
Minor	20-Jan-2013	0	N/A	N/A	None	A passenger slipped off a chairlift.
Minor	20-Jan-2013	0	N/A	N/A	Equipment damaged	Drive fault prevented ropeway from restarting after a stop; passengers unloaded using evacuation drive.
Minor	21-Jan-2013	0	N/A	N/A	None	A gondola cabin came out of the peg guide rail at the drive station after contacting a sign. The sign was installed in the incorrect location. Passengers were removed from the cabin.
Minor	22-Jan-2013	0	N/A	N/A	Equipment damaged	Safety system fault caused ropeway to stop; passengers were unloaded using the evacuation drive.
Minor	24-Jan-2013	1	Multiple fractures	Major	None	A passenger fell on the unload ramp. The passenger became entangled with the chair lift after the restraining bar dropped on the passengers arm.
Minor	25-Jan-2013	0	N/A	N/A	None	A lift was evacuated using the evacuation drive.
Minor	25-Jan-2013	1	Dislocated shoulder	Major	None	A passenger fell while unloading from the carrier.
Minor	26-Jan-2013	0	N/A	N/A	None	Captured deropement.
Minor	27-Jan-2013	0	N/A	N/A	Two sheared mounting bolts	A ropeway was evacuated after the carrier stalled in the unloading station, causing the ropeway to be inoperable.
Minor	30-Jan-2013	0	N/A	N/A	Sheared retaining pins	Maintenance staff discovered sheared retaining pins on the grips of numerous carriers.
Minor	31-Jan-2013	0	N/A	N/A	None	A chairlift was evacuated with the evacuation drive after the main drive engine would not start.
Minor	1-Feb-2013	1	Sprained knees	Minor	None	A passenger fell on the unload ramp while unloading from a chairlift.
Minor	1-Feb-2013	0	N/A	N/A	Equipment damaged	Drive fault cause ropeway to stop; passengers unloaded using evacuation drive.
Minor	2-Feb-2013	1	Nosebleed, arm/shoulder injury	Minor	None	Passengers fell on the ramp while unloading.
Minor	2-Feb-2013	0	N/A	N/A	None	A lift was evacuated using the evacuation drive.
Minor	3-Feb-2013	1	Possible fracture and dislocation	Major	None	A passenger fell on the ramp after unload.
Minor	4-Feb-2013	0	N/A	N/A	None	Deropement held by rope catcher.

TABLE A-6: PASSENGER ROPEWAYS INCIDENTS CONT'D

INCIDENT RATING	DATE	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Minor	6-Feb-2013	1	Back pain	Minor	None	A passenger was hit by a carrier.
Minor	9-Feb-2013	0	N/A	N/A	None	Passengers were evacuated from the lift using the evacuation drive.
Minor	10-Feb-2013	1	Sprained knee	Minor	None	A passenger fell while attempting to load carrier.
Minor	10-Feb-2013	1	Pain, Possible sprain	Minor	None	A passenger became entangled with another passenger's ski equipment and fell in the unload area.
Minor	11-Feb-2013	0	N/A	N/A	None	A manual evacuation was required after a chairlift emergency brake hydraulic line ruptured.
Minor	12-Feb-2013	0	N/A	N/A	None	Deropement of a tower (uphill side); missed catcher, rope settled approximately 0.3m above the sheave assembly.
Minor	13-Feb-2013	0	N/A	N/A	Dents on the tower tube	Tower was hit by a snowcat.
Minor	15-Feb-2013	0	N/A	N/A	Crack on tower	Staff discovered a 5mm crack indication on the downhill side of a tower.
Minor	15-Feb-2013	1	Shoulder sprain	Minor	None	A passenger fell riding up the T-bar lift line.
Minor	17-Feb-2013	1	Dislocated shoulder	Major	None	A passenger attempted to unload from the T-seat before the unload area.
Minor	17-Feb-2013	1	Possible hip dislocation	Major	None	A passenger fell on the unload ramp while unloading from a chairlift.
Minor	18-Feb-2013	1	Fractured wrist	Major	None	A passenger fell while loading a surface lift.
Minor	19-Feb-2013	0	N/A	N/A	None	An evacuation was required after a fault in the chairlift's PLC.
Minor	20-Feb-2013	0	N/A	N/A	None	Station sheave deropement.
Minor	24-Feb-2013	0	N/A	N/A	None	Passengers were evacuated from the lift using the evacuation drive.
Minor	24-Feb-2013	0	N/A	N/A	None	After raising the safety bar, a passenger fell from the carrier (approximately five metres).
Minor	5-Mar-2013	0	N/A	N/A	T-bar grip damaged, haul rope scuffed	After two passengers unloaded to the left of the tow path, the carrier swung and caused the deropement of two towers.
Minor	8-Mar-2013	0	N/A	N/A	None	The rope was pulled off the guide sheave assembly at the unload station bullwheel. The haul rope was retained by the guide sheave assembly rope catcher.
Minor	8-Mar-2013	0	N/A	N/A	None	Deropement; rope was not retained by the rope catcher.
Minor	8-Mar-2013	0	N/A	N/A	Flange damaged	Cracked snap ring flange on tower sheave required replacement of sheave during operation. Passengers were unloaded.
Minor	16-Mar-2013	0	N/A	N/A	None	A passenger fell from a carrier (approximately 20 feet).
Minor	16-Mar-2013	0	N/A	N/A	None	Deropement; haul rope retained by rope catchers.
Minor	21-Mar-2013	0	N/A	N/A	Haul rope scuffed	The lift operator swung a platter in an attempt to avoid the platter contacting a passenger. The swinging platter caused a guide sheave assembly to derope.
Minor	22-Mar-2013	1	Dislocated shoulder	Major	None	A skier collided with two passengers riding a T-bar, resulting in an injury to one passenger.
Minor	22-Mar-2013	1	Pain, discomfort	Minor	None	A passenger lost her balance and tripped as she attempted to unload from the T-bar, resulting in injury.
Minor	30-Mar-2013	1	Pain	Minor	None	A passenger started to ski out of the T-bar's tow path and contacted a tower.
Minor	3-Apr-2013	0	N/A	N/A	Broken compression component	Deropement of the platter lift sheave assembly.
Minor	7-Apr-2013	0	N/A	N/A	None	A passenger fell from carrier prior to unloading area.
Minor	20-Apr-2013	0	N/A	N/A	None	Retained bull wheel deropement.
Minor	20-Apr-2013	1	Lower leg fracture	Major	None	Misload resulting in injury.
Minor	28-Apr-2013	1	Pain	Minor	None	A passenger approaching the loading area fell backward and off of the loading ramp onto the ground.
Minor	4-Jun-2013	0	N/A	N/A	Damaged components	During hauling rope rigging of a chairlift for required inspections, the contractor used rigging anchor points not intended or designed for the type of rigging work being conducted. While doing this work, the concrete anchor was pulled out of the water saturated ground which caused the lift drive station carriage to move forward causing other lift component damage.
Minor	19-Jun-2013	0	N/A	N/A	None	A crack was discovered by operational staff in the flange supporting the incoming running wheel rail.
Minor	29-Jun-2013	1	Fracture and possible concussion	Major	None	A foot passenger fell while disembarking the chair at the unload area.

TABLE A-6: PASSENGER ROPEWAYS INCIDENTS CONT'D

INCIDENT RATING	DATE	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Minor	9-Jul-2013	0	N/A	N/A	None	A passenger slipped out of the carrier after loading.
Minor	30-Jul-2013	1	Laceration requiring stitches	Minor	None	A passenger tripped over a safety gate post and fell onto the ramp.
Minor	30-Jul-2013	0	N/A	N/A	Electrical damage	Passengers unloaded with the evacuation drive due to intermittent failure of the PLC input/output card.
Minor	21-Dec-2013	0	N/A	N/A	None	A passenger skied out of the tow path and caused the deropement. The haul rope was retained by the rope catchers and the deropement switch actuated the stop of the platter lift.
Minor	22-Dec-2013	0	N/A	N/A	None	A platter grip that had been improperly tightened during a relocation became detached from the haul rope and fell to the ground after exiting the return station bullwheel.
Minor	25-Dec-2013	0	N/A	N/A	Broken grip spring and spring guide	Maintenance staff discovered a broken grip spring and spring guide before the gondola was in operation.
Minor	30-Dec-2013	0	N/A	N/A	None	Deropement, Misaligned guidage caused a handle on the handle tow to pry the haulrope off of the bullwheel.

TABLE A-7: AMUSEMENT DEVICES INCIDENTS

INCIDENT RATING	DATE	QTY. INJURIES	INJURY DESCRIPTION	INJURY RATING	DAMAGE	INCIDENT DESCRIPTION
Minor	19-Jan-2013	2	Redness, bruising soreness	Minor	Surface cracking on sled's right side fin	An occupied bobsleigh runing down the course tipped on its side after exiting a corner.
Minor	20-Jan-2013	0	N/A	N/A	None	Two wheels on the train's rear car derailed.
Minor	15-Jun-2013	1	Concussion	Major	None	A rider was jumping near the inflatable rise's barrier. The rider fell forward and over the barrier.
Minor	25-Jun-2013	1	Soft tissue injury	Minor	None	A rider bumped his leg on the end of the launch ramp.
Minor	13-Jul-2013	1	Laceration	Minor	None	A rider lost is balance after exiting corner 5. His hand became caught under the cart as he tried to steady himself.
Minor	17-Jul-2013	0	N/A	N/A	Broken wires in one strand	During a routine inspection, maintenance staff discovered a broken strand in the haul rope
Minor	23-Jul-2013	2	Laceration	Minor	None	Two riders (one adult and one child) lost their balance while on a waterslide. The child struck his head on the flume.
Minor	24-Jul-2013	1	Laceration requiring sutures	Minor	None	Two riders (one adult and one infant) lost their balance while on a waterslide. The child struck her head on the side of the flume.
Minor	26-Jul-2013	0	N/A	N/A	Aluminum component (drive rim) damaged in one location	The ride's drive rim for the east side came out of alignment and contacted the tire's mounting frame. The ride was stopped and passengers were evacuated.
Minor	30-Jul-2013	0	N/A	N/A	Components damaged	A ride's motor fell to the ground. Sixteen riders wee evacuated from the amusement ride.
Minor	4-Aug-2013	1	Pain, discomfort	Minor	None	A rider's leg became trapped between the ride's flume edge and alignment wheel.
Minor	8-Aug-2013	1	Ankle fracture	Major	None	A rider fractured her ankle at the waterside's landing area.
Minor	15-Aug-2013	2	Laceratons requiring stitches	Minor	None	Two riders collided at the bottom of a slide.

Appendix B1: Enforcement Actions - Compliance Orders

A Compliance Order is an enforcement document issued to a person by BC Safety Authority that specifies actions to be taken, stopped, or modified where, in the opinion with BC Safety Authority, there exists a risk of personal injury or damage to property associated with work or products regulated by the *Safety Standards Act*. The following compliance orders were issued in 2013.

Notes:

- **BC Safety Authority is subject to the *Freedom of Information and Protection of Privacy Act*. Provincial legislation restricts the information that may be published with respect to individuals. Accordingly, BC Safety Authority may provide descriptions of enforcement actions taken but may not identify individuals by name.**
- **DBA represents 'doing business as' and O/A represents 'operated as'.**

Table B1-1: ELECTRICAL COMPLIANCE ORDERS

COMPLIANCE ORDER NO.	ISSUED TO	DUTY HOLDER HAS LICENCE OR QUALIFICATION (YES/NO)	CATEGORY	DESCRIPTION
CO-2013-0001	Northwest Wood Treaters LP	Yes	Outstanding non - compliance(s)	An assessment identified non-compliances with respect to regulated work. The duty holder failed to respond to safety officer notifications stipulating a deadline for compliance.
CO-2013-0014	NR Excavating & Services Ltd.	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.
CO-2013-0017	An individual	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others and required to produce a record of information related to his performance of regualted work.
CO-2013-0018	Dhesi Electric Ltd.	No	Use of unqualified workers	An assessment identified an unlicensed individual directing an unqualified person to perform regulated work. The duty holder was ordered to stop performing or directing others to do regulated work.
CO-2013-0030	MWL Demolition Ltd.	No	Use of unqualified workers	An assessment identified individual(s) performing regulated work. A certificate of qualification for performing regulated work could not be produced. The duty holder was ordered to stop allowing unqualified individuals to perform regulated work.
CO-2013-0033	Lakeridge Homes (2007) Ltd.	No	Sale of uncertified equipment	An assessment found unapproved electrical equipment displayed and offered for sale. The duty holder was ordered to stop displaying, or offering for sale, any electrical equipment unless it bears evidence of approval.
CO-2013-0036	Lakeland Mills Ltd.	No	No valid BC certificate of qualifications	An assessment determined that the Field Safety Representative named on an electrical operating permit was no longer contracted or employed by the permit holder. The order requires that the permit holder immediately notify the BCSA if the Field Safety Representative named on the operating permit ceases to be contracted or employed by the permit holder.
CO-2013-0038	Technics Electric Ltd.	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0044	Alamtron (B.C.) Ltd.	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0045	An individual	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.
CO-2013-0046	TCA Industries Ltd.	Yes	Use of unqualified workers	An assessment identified individual(s) performing regulated work. A certificate of qualification for performing regulated work could not be produced. The duty holder was ordered to stop allowing unqualified individuals to perform regulated work.
CO-2013-0050	An individual	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.
CO-2013-0051	An individual	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.
CO-2013-0052	Vent Air Heating and Refrigeration Ltd.	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.
CO-2013-0053	Belco Holdings Inc.	No	Outstanding non - compliance(s)	An assessment identified non-compliances with respect to regulated work. The duty holder failed to respond to safety officer notifications stipulating a deadline for compliance.

Appendix B1: Enforcement Actions - Compliance Orders Cont'd

Table B1-2: BOILERS, PRESSURE VESSELS AND REFRIGERATION COMPLIANCE ORDERS

COMPLIANCE ORDER NO.	ISSUED TO	DUTY HOLDER HAS LICENCE OR QUALIFICATION [YES/NO]	CATEGORY	DESCRIPTION
CO-2013-0004	Salem Contracting Ltd.	Yes	No Permit	An assessment determined that regulated work had been performed without a required permit. The duty holder was ordered to stop performing work without providing notification or obtaining a permit where a permit is required.
CO-2013-0009	R H Jones & Sons Mechanical Ltd.	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0010	Centennial Ventures Ltd.	Yes	Outstanding non-compliance(s)	An assessment identified non-compliances with respect to regulated work. The duty holder failed to respond to safety officer notifications stipulating a deadline for compliance.
CO-2013-0015	Norweld Mechanical Installations Inc.	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without providing notification or obtaining a permit where a permit is required.
CO-2013-0016	An individual	No	No valid BC certificate of qualifications	An investigation determined that an individual had committed an offence by knowingly furnishing false information about his qualifications under the Boiler, Pressure Vessel and Refrigeration Safety Regulations. The individual was ordered to stop providing false declarations.
CO-2013-0027	Arrow Lakes Air Conditioning and Mechanical Systems Ltd.	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.
CO-2013-0037	Lakeland Mills Ltd.	No	Incorrect Permit	An assessment determined that regulated work had been performed under a permit that was not appropriate for the purpose. The duty holder was ordered to perform work in accordance with the terms and conditions of the permit type required under the particular circumstance.
CO-2013-0049	0948449 BC Ltd.	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.

Table B1-3: GAS COMPLIANCE ORDERS

COMPLIANCE ORDER NO.	ISSUED TO	DUTY HOLDER HAS LICENCE OR QUALIFICATION [YES/NO]	CATEGORY	DESCRIPTION
CO-2013-0002	An individual	Yes	No Permit	An assessment found regulated work performed without a permit. The duty holder was ordered to provide a record of installations where work was performed that required a permit.
CO-2013-0003	An individual	Yes	Outstanding non-compliance(s)	An assessment identified non-compliances with respect to regulated work. The duty holder failed to respond to safety officer notifications stipulating a deadline for compliance.
CO-2013-0005	Babine Forest Products Ltd.	Yes	Use of unqualified workers	An assessment determined that regulated work had been performed beyond the scope of the duty holder's qualifications. The duty holder was ordered to stop performing regulated work unless the work can be demonstrated to be within the scope of the particular qualification.
CO-2013- 0006	An individual	Yes	Performing regulated work beyond scope of qualifications	An assessment identified an individual performing regulated work beyond the scope of his qualificaitons. The duty holder was ordered to stop allowing unqualified individuals to perform regulated work.
CO-2013-0007	An individual	Yes	Performing regulated work beyond scope of qualifications	An assessment determined that regulated work had been performed beyond the scope of the duty holder's qualifications. The duty holder was ordered to stop performing regulated work unless the work can be demonstrated to be within the scope of the particular qualification.
CO-2013-0008	An individual	Yes	No	Permit An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0011	Atlas Plumbing & Heating Ltd.	No	Use of unqualified workers	An assessment identified unqualified individual(s) performing regulated work. The work was performed without holding a contractor's license or permit.
CO-2013-0012	452702 BC Ltd.	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0019	Border Plumbing & Heating Ltd.	Yes	Outstanding non-compliance(s)	An assessment identified non-compliances with respect to regulated work. The duty holder failed to respond to safety officer notifications stipulating a deadline for compliance.
CO-2013-0023	Hard Hammer Construction Ltd.	Yes	Outstanding non-compliance(s)	An assessment identified non-compliances with respect to regulated work. The duty holder failed to respond to safety officer notifications stipulating a deadline for compliance.
CO-2013-0024	An individual	Yes	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.

Appendix B1: Enforcement Actions - Compliance Orders Cont'd

Table B1-3: GAS COMPLIANCE ORDERS CONT'D

COMPLIANCE ORDER NO.	ISSUED TO	DUTY HOLDER HAS LICENCE OR QUALIFICATION (YES/NO)	CATEGORY	DESCRIPTION
CO-2013-0025	An individual	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0026	An individual	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.
CO-2013-0034	546186 BC Ltd.	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0035	An individual	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013- 0039	An individual	No	Provide Records	An assessment determined that a duty holder had not responded to a request to submit information related to the sale of regulated equipment. The duty holder was ordered to provide the information.
CO-2013-0040	An individual	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0041	An individual	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0042	An individual	No	Failure to take regulated safety precautions	An assessment determined a safety hazard with respect to regulated installations in dwelling structures at a recreational facilities. The duty holder was ordered to secure the services of a licensed contractor to correct non-compliances where identified by inspection. In all other dwelling structures where an inspection was not performed, the duty holder was ordered to either correct or remove regulated equipment as required.
CO-2013- 0047	An individual	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.
CO-2013-0048	An individual	No	No contractor's license	An assessment determined that regulated work had been performed without the required license. The duty holder was ordered to stop performing regulated work for others.

Table B1-4: ELEVATING DEVICES COMPLIANCE ORDERS

COMPLIANCE ORDER NO.	ISSUED TO	DUTY HOLDER HAS LICENCE OR QUALIFICATION (YES/NO)	CATEGORY	DESCRIPTION
CO-2013-0020	Advance Material Handling (2008) Ltd.	No	No contractor's license	An assessment determined that regulated work had been performed without the required license or qualification. The duty holder was ordered to stop performing regulated work unless authorized to do so.
CO-2013-0021	Hallmark Poultry Processors Ltd.	No	No Permit	An assessment determined that regulated equipment was being operated without the required permit. The duty holder was ordered to stop operating regulated equipment without an operating permit.
CO-2013- 0028	Otis Canada, Inc.	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0029	R.A.M. Manufacturing Ltd.	Yes	No Permit	An assessment determined that regulated work had been performed without the required permit. The duty holder was ordered to stop performing work without a permit where a permit is required.
CO-2013-0031	Otis Canada, Inc.	Yes	Failure to address a safety hazard	An assessment determined that an incident had occurred but wasnot reported to the BCSA. The duty holder was ordered to report all incidents as required by regulation and implement a plan to ensure a consistent practice of reporting incidents in accordance with this requirement.
CO-2013-0032	Blackcomb Skiing Enterprises Limited Partnership	No	No Permit	An assessment determined that an operating permit was required for the operation or maintenance of a regulated product. The duty holder was ordered to obtain an operating permit
CO-2013-0043	Otis Canada, Inc.	Yes	Outstanding non-compliance(s)	An assessment identified non-compliances with respect to regulated work. The duty holder failed to respond to safety officer notifications stipulating a deadline for compliance.

Appendix B1: Enforcement Actions - Compliance Orders Cont'd

Table B1-5: PASSENGER ROPEWAYS COMPLIANCE ORDERS

COMPLIANCE ORDER NO.	ISSUED TO	DUTY HOLDER HAS LICENCE OR QUALIFICATION [YES/NO]	CATEGORY	DESCRIPTION
CO-2013-0013	Mount Timothy Ski Society	Yes	Failure to take regulated safety precautions	An assessment determined a safety hazard with respect to a regulated installation. The duty holder was ordered to stop operating regulated equipment in an unsafe manner.
CO-2013-0022	Crytal Mountain Resorts Ltd.	Yes	Failure to address a safety hazard	An investigation identified regulated equipment operated in a manner which created an unsafe condition. The duty holder was ordered to submit a training plan in order to promote safe operation of the equipment.

Appendix B2: Enforcement Actions - Sanctions

A sanction is an administrative penalty levied by a safety manager to penalize non-compliant behaviour. The following sanctions were imposed by BC Safety Authority in 2013.

Note: BC Safety Authority is subject to the *Freedom of Information and Protection of Privacy Act*. Provincial legislation restricts the information that may be published with respect to individuals. Accordingly, BC Safety Authority may provide descriptions of enforcement actions taken but may not identify individuals by name. As well, individuals or corporate entities must be allowed due process in order to exercise their right of appeal upon receipt of a sanction. BC Safety Authority will not identify these sanctions if the parties are involved in this process at the time of publication.

Table B2-1: SANCTIONS IMPOSED

INDUSTRY SECTOR	TYPE	NUMBER	ISSUED TO	DUTY HOLDER HAS LICENCE OR QUALIFICATION (YES/NO)	CATEGORY	DESCRIPTION
Elevating Devices	Monetary Penalty	MP-2013-0001	BRADSHAW CONSTRUCTION COMPANY LTD	No	No Permit	A $5300 monetary penalty was imposed on the duty holder for operating regulated elevating equipment without the required permit.
Passenger Ropeways	Monetary Penalty	MP-2013-0002	CRYSTAL MOUNTAIN RESORTS LTD	Yes	Failure to comply with a safety order	A $8000 monetary penalty was imposed on the duty holder for failure to comply with a safety order.
Gas	Monetary Penalty	MP-2013-0004	AN INDIVIDUAL	Yes	Failure to comply with a compliance order, term and condition of a license and performing regulated work without a permit	A $4000 monetary penalty was imposed on the duty holder for failure to comply with a compliance order, term and condition of a license and for performing regulated work without a permit.
Gas	Monetary Penalty	MP-2013-0005	0845515 BC LTD.	No	Performing regulated work without the required certificate of qualification, permit or permission	A $4000 monetary penalty was imposed on the duty holder for performing regulated work without the required certificate of qualification, permit or permission.
Gas	Monetary Penalty	MP-2013-0006	RISKE CREEEK MANUFACTURING LTD.	No	Failure to comply with a compliance order	A $6000 monetary penalty was imposed on the duty holder for failure to comply with a compliance order.
Gas	Monetary Penalty	MP-2013-0007	AN INDIVIDUAL	No	Performing regulated work without the required permission	A $750 monetary penalty was imposed on the duty holder for performing regulated work without the required permission.
Electrical	Monetary Penalty	MP-2013-0008	KORAB ELECTRIC INC.	Yes	Failure to comply with Safety Manager applied terms and conditions on a license	A $4700 monetary penalty was imposed on the duty holder for failure to comply with specific terms and conditions of a license as applied by the Safety Manager.
Electrical	Monetary Penalty	MP-2013-0009	WESTVIEW MOTOR INN LTD.	No	Failure to comply with a compliance order	A $2200 monetary penalty was imposed on the duty holder for failure to comply with a compliance order.
Gas	Conditions attached to certificate of qualification	N/A	AN INDIVIDUAL	Yes	Failure to comply with a condition of a certificate of qualification (competency)	A sanction was imposed by the Safety Manager on the duty holder in regards to a certificate of qualification. The Safety Manager attached specific conditions onto the certificate of qualification subsequent to an incident investigation.
Electrical	Monetary Penalty	MP-2013-0011	AN INDIVIDUAL	No	Failure to comply with a compliance order	A $1000 monetary penalty was imposed on the duty holder for failure to comply with a compliance order.
Electrical	Monetary Penalty	MP-2013-0012	CONNAUGHT MOTOR INNS LTD.	No	Failure to comply with a compliance order	A $8000 monetary penalty was imposed on the duty holder for failure to comply with a compliance order.
Electrical	Monetary Penalty	MP-2013-0013	735284 BC LTD.	Yes	Failure to comply with SSGR, s.12	A $500 monetary penalty was imposed on the duty holder for failure to obtain permits before performing regulated work.

Appendix C: Regulatory Instruments and Amendments

BC Safety Authority uses certain regulatory instruments to assist with the administration of the *Safety Standards Act* and the *Railway Safety Act*.

- Safety orders are issued to prevent or reduce the risk of personal injury or damage to property. Compliance is mandatory.
- Directives are instruments that clarify or provide new interpretation of a regulation or code. Compliance is mandatory.
- Information bulletins provide helpful information and clarification on existing regulations or codes.

This appendix provides details regarding the safety orders, directives and information bulletins issued by BCSA in 2013. Regulatory amendments are also included in this listing.

Table C-1: LISTING OF REGULATORY INSTRUMENTS AND AMENDMENTS

INDUSTRY SECTOR	INSTRUMENT TYPE	ISSUE DATE	DOCUMENT NO.	TITLE	DESCRIPTION
Elevating Devices	Safety order	April 12, 2013	SO-ED 2013-01	Hydraulic Elevators – Griffin Controllers	This safety order was issued to all Licensed Elevator Contractors and Building Owners /Property Managers and applies to all hydraulic Elevators with Griffin Controllers as a result of a serious injury. The order requires signage to be posted warning that the elevator may enter high speed during inspection and the elevators must be altered and tested by April 26, 2015 with the appropriate signage and filing of the alteration with BCSA.
Electrical/Gas	Safety order	May 7, 2013	SO-EL/GA 2013-02	Combustible Dust In Wood Processing Facilities	This safety order was issued to owners and operators of wood processing facilities requiring them to perform an assessment of facilities for hazardous locations due to the presence of combustible dust. Where gas or electrical equipment is installed within a hazardous location, a plan to suitably mitigate the combustion risk must be documented.
Gas	Safety order	February 4, 2013	SO-GA 2013-01	Installation Or Use Of Certified Gas Fireplaces Manufactured By Canadian Fire Hearth Manufacturing Inc. - Prohibited	This safety order requires any gas fireplace manufactured by the Canadian Fire Hearth Manufacturing Inc. which does not bear the certification seal of a recognized testing agency (including the "Riveria 66" model): • Must be immediately removed from operation; and, • May not be sold, leased, rented, installed or other used for any purpose within BC.
Electrical	Directive	September 3,2013	D-EL 2013-01	BCEC Section 2	This directive provides clarification on Rule 2-304 regarding repairs or alterations on live equipment.
Gas	Directive	June 4, 2013	D-GA 2103-01	Requirements For Installation Of Gas Meters On Customer-Owned Piping Systems	This directive was issued to clarify that any gas meters installed downstream of a gas utility's meter are subject to the B149.1 Nature Gas and Propane Installation Code.
Gas	Directive	June 11, 2013	D-G5 090213 1 Revision One	PropressG and MegapressG Press Connect Fittings For Natural / Propane Gas Systems	This directive was updated to clarify that the CAN/CSA B149.1-10 Natural Gas and Propane Installation Code requirements for utilization of specialized piping and tubing fittings.
Boilers, Pressure Vessels and Refrigeration	Directive	March 19, 2013	D-BP- 2013-01 Revision One	Registration And Permit Requirements For Boilers In Heating Plants.	This directive was issued to owners, licensed contractors, consulting engineers, manufacturers and designers of heating plants to clarify the requirements concerning the registration, permitting and staffing requirements for heating plants.
Boilers, Pressure Vessels and Refrigeration	Directive	July 12, 2013	D-BP 2013-02	Determining The Capacity Of Refrigeration Systems	This directive was issued to owners of refrigeration plants and refrigeration contractors to specify how the prime mover nameplate rating is to be determined.
Boilers, Pressure Vessels and Refrigeration	Directive	July 12, 2013	D-BP 2013-03 Supersedes D-B6 070402 3	Exemption From Registration Requirements For Category A, B, C, and G Category Fittings.	This directive clarifies a 2007 directive on exemptions of category A, B, C, and G fittings from registration.
Elevating Devices	Directive	October 16, 2013	D-L4 110803 5 Revision 03	Major & Minor Alterations	This is a revision to a long-standing directive. The purpose of the directive is to clarify requirements under section 25 of the Elevating Devices Safety Regulation concerning design registration when alterations are being done to existing elevating devices.
Railways	Directive	September 5, 2013	R2013-09-05	Safety and Security of Locomotives & Car Moving Equipment	This directive was issued as a result of the Lac-Megantic accident to clarify requirements for unattended locomotives and car moving equipment.

Table C-1: LISTING OF REGULATORY INSTRUMENTS AND AMENDMENTS CONT'D

INDUSTRY SECTOR	INSTRUMENT TYPE	ISSUE DATE	DOCUMENT NO.	TITLE	DESCRIPTION
Railways	Directive	September 6, 2013	R2013-09-06	Use of Un-Authorized Electronic Devices For Employees in safety Critical Positions	This directive orders all provincial railway companies to prohibit employees working in safety critical positions from: • Using electronic devices unless directly used in their work duties and, • Texting and using social media while performing their duties.
Passenger Ropeways	Directive	January 8, 2013	D-P4 070101 1 Revision 4	Incident Reporting Requirements With Respect To Passenger Ropeways And Passenger Conveyors	This directive to businesses and contractors replaces a revision issued in 2009 to clarify the reporting of incidents.
Elevating Devices	Information bulletin	March 19, 2013	IB-ED-2013-01	Changes For Elevating Devices Operating Permits: New Installations	This information bulletin provides information about changes to the issuance of Operating Permits for new installations as a result of the new IT system.
Elevating Devices	Information bulletin	May 15 2013,	IB-ED-2013-02	Elevating Devices Safety Regulation – Notification Of Amendment	This information bulletin provides information about changes as a result of adoption of the 2009 edition of the CSA B355 code (Lifts for persons with physical disabilities) including : • Requirement to keep a maintenance log; • Requirement for two way communication system; • Repeal of requirements now specified in the adopted code; and, • Repeal of affidavit submission requirements for personnel hoist contractors.
Electrical	Information bulletin	September 3, 2013	IB-EL 2013-01	BC Electrical Code - Section 2, Requirement To De-Energize Electrical Equipment	This information bulletin was issued to provide further details on Directive No. D-EL 2013-01 regarding electric work where on energized equipment.
Electrical	Information bulletin	October 3, 2013	B-E3 071019 3 Revision 4	Approved Certification Marks for Electrical Products	This information bulletin updates the approved certification marks that are recognized in BC. The information bulletin was originally issued as a Directive in 2006 and has been updated periodically since then.
Electrical	Information bulletin	November 4, 2013	IB-EL 2013-02	New Permit Category: Extra Low Voltage/ Low Energy Decals	This information bulletin provides information concerning pre-purchase of decals to be used as permits for extra low voltage work (e.g., central vacuum or security alarms). The decals can only be used for installations where the value is under $250.
Electrical/Gas	Information bulletin	March 27, 2013	IB-A1 2013-01	Changes To IT System And Online Permits Purchasing	This information bulletin was issued to inform electrical and gas clients that with access to the BC OnLine System for obtaining permits their access would cease on April 15th when the new BCSA IT System (MyConnection) was implemented.
Electrical/Gas	Information bulletin	June 26, 2013	IB-A1 2013-02 Revision 1	Changes To Access Dates For Online Services	This information bulletin informed clients who did not have access to the BC Online System that they would not be able to use the new IT (MyConnection) on July 4th 2013 as previously communicated. As a result these clients will not be able to use MyConnection until improvements and upgrades are completed.
All	Information bulletin	May 6, 2013	IB-A1-2013-03	Client Documents Delayed	This information bulletin informs clients that issuing of documents, including operating permits, certificates of inspection and invoices, may be delayed due to implementation of the new BCSA IT System. Clients were informed that there would be no penalties where BCSA records indicate invoicing delays occurred.
Gas	Information bulletin	April 29, 2013	IB-GA 2013-01	Pipe Sizing And Pressure Drop Requirements	This information bulletin was issued to clarify that if a conflict exists between the manufacturer's certified installation instructions and Clause 4.1.4 of the CAN/CSA B149.1-10 Natural Gas and Installation Code, the code requirements shall prevail unless otherwise approved under a Request for Variance.
Gas	Information bulletin	August 15, 2013	B-G5 051206 4 Revision 01	Clearance To Regulator/Meter Set Relief Device	This information bulletin updates the minimum clearance requirements for gas meters.
Gas	Information bulletin	October 28, 2013	IB-GA 2013-02	Portable Appliance and Fan Equipment Effects on Buildings	This information bulletin was issued to homeowners/occupants following a carbon monoxide incident caused by depressurization. The information bulletins relay recommendations that are intended to reduce the risk of carbon monoxide back-venting into homes.
Gas	Information bulletin	December 12, 2013	IB-GA 2013-03	Hazardous Location Requirements – Gas Equipment Installations	This information bulletin clarifies what a "hazardous location" is. It then goes on to provide the processes that must be followed when a gas appliance, which has not been certified for installation/use in hazardous locations, is located in a previously non-hazardous location whose status has subsequently changed to that of a hazardous location.
Boilers, Pressure Vessels and Refrigeration	Information bulletin	February 6, 2013	IB-BP-2013-01	Design Registration – Changes To The Safety Authority's Application Forms For Reciprocal Registrations	This information bulletin informs clients of changes to the application process for reciprocal registrations o improve processing times.

Table C-1: LISTING OF REGULATORY INSTRUMENTS AND AMENDMENTS CONT'D

INDUSTRY SECTOR	INSTRUMENT TYPE	ISSUE DATE	DOCUMENT NO.	TITLE	DESCRIPTION
Boilers, Pressure Vessels and Refrigeration	Information bulletin	July 12, 2013	IB-BP 2013-02	Recommended Maintenance And Inspection For Low Pressure Steam Boilers Not Exceeding 30 m3.	This information bulletin informs owners of low pressure steam boilers of the minimum daily, weekly, semi annual and annual requirements for maintenance, inspection and testing.
Railways	Information bulletin	April 25, 2013	R-2013-04-25	Contractors Working on Provincial Railway Properties	This information bulletin provides details on the requirements for railways when contractors are working on provincially regulated railways.
Railways	Information bulletin	April 26, 2013	R-2013-04-26	Industrial Railways Compliance To: Canadian Railway Operating Rules (CROR) "SIGNALS"	This information bulletin provides details on the requirements of railways to comply with CROR requirements for signals when work is being undertaken.
Railways	Information bulletin	November 27, 2013	R2013-11-27	Bridges & Culverts Mitigating Risks During and After Severe Weather	This information bulleting presents recommended best practices, in the event of flooding or high flow situations, for railways with track located on bridges or over culverts.
Railways	Information bulletin	November 28, 2013	R2013-11-28	Railway Operations in Winter Conditions	This information bulletin provides recommended best practices to railways for managing the risks associated with ice, snow and other winter-related debris on or around railway tracks.
Railways	Railway safety advisory	June 27, 2013		Railway Employee Fatality in Calgary Alberta	This safety advisory identifies sections of the *Railway Safety Program: Safety Handbook* that provincial railways must follow.
Boilers,Pressure Vessels and Refrigeration	Regulatory amendment				B.C. reg. 43/2013 came into force on February 6, 2013. The regulation amends the Schedule to the Power Engineers, Boiler, Pressure Vessel & Refrigeration Safety Regulation in order to adopt the latest editions of several technical boiler codes and standards.
Elevating Devices	Regulatory amendment	July 2, 2013	N/A	N/A	Ministerial Order M 086 was deposited as B.C Reg. 164/2013 on April 3, 2013. The amendments adopt the latest edition of the CSA B355 code for Lifts for Persons with Physical Disabilities as well as various house keeping provisions for the Elevating Devices Safety Regulation. All amendments came into force on July 2, 2013.
Elevating Devices	Regulatory amendment	In Progress	N/A	N/A	A recommendation for amendment was submitted to the Province in 2013. Drafting instructions for the Ministry of Justice were completed by BCSA and Ministry of Natural Gas Development staff in Q2.

Appendix D: Stakeholder Engagement Activities

Table D-1: TECHNOLOGY ADVISORY COMMITTEES WORKING GROUPS

ISSUE TYPE	ISSUE	INDUSTRY SECTOR
Regulatory improvement	Review regulatory requirements for all ziplines in BC	Amusement Devices
Technical safety	Technical safety issues for refrigeration contractors	Boiler
Technical safety	Fourth class power engineer task analysis toward a third class power engineer certificate of qualifications	Boiler
Regulatory improvement	Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation review	Boiler
Service delivery	Defining requirements for the recognition of an electrical training program by the Provincial Safety Manager	Electrical
Technical safety	Lockout procedures for maximizing worker safety	Electrical
Technical safety	Review of Electrical Safety Regulation section 18	Electrical
Technical safety	Emergency operations	Elevating Devices
Technical safety	Private residences elevating devices	Elevating Devices
Regulatory improvement	Review requirements for obtaining a Gas contractor licence	Gas
Technical safety	Apprenticeship review in preparation for red seal for gasfitters	Gas
Regulatory improvement	Gas Safety Regulation review	Gas
Regulatory improvement	Review of directive on small utilities	Gas
Service delivery	Gasfitter bursary requirements	Gas
Technical safety	Mitigating risks for aging ropeways in BC	Passenger Ropeways
Technical safety	Certification of passenger ropeway maintenance personnel	Passenger Ropeways

Table D-2: SAFETY STANDARDS ADMINISTRATORS' GROUP WORKING GROUPS

ISSUE TYPE	ISSUE	INDUSTRY SECTOR
Technical safety	Sharing of incident reports among all jurisdictions	Electrical/Gas
Technical safety	Poorly performing contractors / enforcement information sharing among all jurisdictions	Electrical/Gas
Service delivery	Cross-jurisdictional notification of applications for building, electrical and gas permits	Electrical/Gas

Table D-3: AS@NEEDED CONSULTATION ISSUES BY INDUSTRY SECTOR

INDUSTRY SECTOR	CONSULTATION ISSUE
Amusement Devices	• Fee increase consultation
Boilers, Pressure Vessels and Refrigeration	• Draft directive on third class power engineering certificate of qualifications • Alternative Safety Approaches fee structure and increase consultation [Note 1]
Electrical	• Fee structure consultation • Draft safety order on combustible dust hazards related to electrical and gas equipment
Elevating Devices	• Fee structure consultation
Gas	• Draft safety order on combustible dust hazards related to electrical and gas equipment
Passenger Ropeways	• Fee increase consultation

Appendix D: Stakeholder Engagement Activities Cont'd

The following table outlines the industry associations as well as national codes and standards committees that BCSA employees currently sit as active committee members.

Table D-4: ASSOCIATIONS/NATIONAL CODES AND STANDARDS COMMITTEES

INDUSTRY SECTOR	ASSOCIATIONS AND NATIONAL CODES & STANDARDS COMMITTEES
Amusement Devices	CAN/CSA Z267-00 Harmonization Committee ASTM F24 – Standards Development for Amusement Rides/Devices (Harmonization Committee) NAARSO (National Association of Amusement Ride Safety Officials)
Boilers, Pressure Vessels and Refrigeration	Association of Chief Inspectors Technical Committee / Clause 4.5, 8, 11 & annexure D of CSA-B51 CSA B51/B52 Committee American Welding Society (AWS) Project Management Institute (PMI) ASME Code committee International pressure equipment integrity association (IPEIA) National Board of Boiler Inspectors General Meeting Standardization of Power Engineers Examination Committee Interprovincial Power Engineering Curriculum Committee PowerConnect Association of Professional Engineers and Geoscientists of BC
Electrical	Committee on Canadian Electrical Code Part I – CSA ULC Advisory Council CSA Z463 Canadian Advisory Council on Electrical Safety (CACES) International Association of Electrical Inspectors (IAEI)
Elevating Devices	Association of Provincial Chief Elevator Inspectors (Chair) CSA Advisory Council on Elevating Devices Canadian Standards Association CSA B44 Elevator Safety Code Canadian Standards Association CSA B44/ASME A17.5 Elevator & Escalator Electrical Equipment Canadian Standards Association CSA B311 Manlifts Safety Code Canadian Standards Association CSA B355 Lifts for Persons with Physical Disabilities Safety Code Canadian Standards Association CSA Z185 for Personnel Hoists APEGBC Building Codes Committee ASME A17 Standards Committee for Elevators and Escalators National Association of Elevator Safety Authorities
Gas	CSA B149.1 Code Committee CSA B149.2 Code Committee CSA B149.3 Code Committee CSA B149.5 Code Committee CSA B149.6 Code Committee BC Common Ground Alliance Canadian Propane Association Ad hoc Committee Curriculum Review Committee Examination Requirements for Alternative Fuel Certification Interprovincial Gas Advisory Council CSA Z247 Standard Damage Prevention for the Protection of Underground Energy and Utility Networks CSA Z276 Technical Review Committee
Passenger Ropeways	CAN/CSA Z98 Technical Committee (Vice Chair) Canada West Ski Areas Association International Meeting of Technical Supervisors in Ropeway Engineering (ITTAB)
Railways	Advisory Council on Railway Safety Western Provincial Railway Safety Committee Federal / Provincial Working Group on Railway Safety

Appendix E: Education Activities

Education Activity Descriptions

- Electrical Tech Talks: presentations and supporting documents that educate client groups about specific technical risks and issues.
- Carbon Monoxide – Targeted Incident Reduction: a targeted public awareness program aimed at specific groups that are at risk of carbon monoxide poisoning or death.
- Gas Tech Talks: presentations and supporting documents that educate client groups about specific technical risks and issues.
- Think Permit: a public awareness program targeted at homeowners doing or planning home renovations involving regulated gas and/or electrical work.
- Elevating Devices Mechanics Certification: a client awareness program that promotes the requirements of the new Elevating Devices Mechanics Certification program.
- Boilers and Pressure Vessels Tech Talks: presentations and stand-alone materials that educate clients about specific technical risks and issues.

Program Activities Defined

- Direct Reach: the number of clients, their employees, or members of the public reached directly by members of BCSA through targeted program activities (i.e. Tech Talks, attendance at trade shows).
- Indirect Reach: the estimated number of individuals who will be exposed to digital or program print materials (i.e. ads on the Go Camping BC Mobile App or circulation of publications in which ads were placed such as the 2013-15 Hunting and Trapping Synopsis).
  Note: does not reflect the number of unique individuals reached, as one individual may be reached through multiple channels.
- Activities: all forms of outreach used in support of education programs, including face-to-face, print media and online (i.e. Tech Talk sessions, print ads in targeted publications, web ads).
- New Development: number of new program deliverables developed (i.e. new Tech Talks, new program materials).
- Media: number of media resources developed (videos, online games, radio commercials, etc.).
- Collaborations: number of industry groups that collaborated with BCSA to deliver education programs (i.e. RONA on Think Permit program).

Table E-1: TECH TALKS IN 2013

INDUSTRY SECTOR	TITLE / TOPIC	DESCRIPTION	QTY. OF PARTICIPANTS
Electrical	2012 Electrical Code Changes	This series of Tech Talks guides participants through the key changes in the 2012 BC Electrical Code. Reviewed section by section, the talks highlight changes from CSA and BC Amendments. The presentation is offered in 4, approximately 2 hour modules and in some cases it is available in one day. Contractors and others will find the section 4, conductor ampacity changes, substantially change installation requirements. There is also an entirely new section 64, Renewable Energy Systems.	208
Electrical	Arc Flash	Arc Flash This talk covers the changing attitudes toward electrical safety, applicable acts and regulations, electrical hazards, and risk management. Specific topics include identifying hazards, prevention practices, forms of personal protective equipment (PPE) and safety training.	160
Electrical	Certification Requirements for Manufactured Homes and RV's	This talk is oriented toward professionals (i.e. real estate agents) who deal with the disposal and sale of these homes, and electricians and electrical contractors who work on manufactured homes. Topics include applicable regulations and directives, the seller's responsibilities in the transaction, the process for obtaining BCSA approval for wiring, and requirements and processes for equipment labels.	192
Electrical	Generators	This talk covers codes and regulations that apply to installation, maintenance and testing of generator systems, and other general requirements for these systems. Specific topics include loading and sizing, transfer switches, grounding and bonding, and applicable wiring methods.	10
Gas	Introduction to BCSA	This talk is designed to provide an overview of BC Safety Authority for 4 year Gas Fitter students. Specific topics include the role of the Safety Officer, Expectations of Gas Professionals and the RAP program.	54
Gas	Understanding Enforcement and the Top 5 Non Compliances	This talk provides and outlines the types of enforcement actions BC Safety Authority may apply in cases of non compliance and why they might be used. It also reviews the top noncompliance issues commonly seen by BC Safety Authority safety officers in the field.	38

Table E-2: PUBLIC AWARENESS ACTIVITIES IN 2013

TITLE / TOPIC	DESCRIPTION
Carbon Monoxide: Be in the Know	This program aims to decrease the numbers of carbon monoxide (CO) related incidents and fatalities in BC each year by encouraging campers and recreational vehicle (RV) users to leave portable gas appliances outside enclosed spaces and promoting the use of CO detectors in the home. Through direct interaction with seniors, campers in campsites, distributing material through RV dealers, and social media advertising, the program recorded significant reach in 2013.
Think Permit	Think Permit targets homeowners with information about the importance of obtaining permits for regulated electrical and gas work. Program materials were distributed through municipal governments permit offices and collaborations with various home improvement retail stores in the Interior.

APPENDIX E

Appendix F: Media Relations Activities

During the period January-December 2013, BC Safety Authority took the following media relations actions to raise awareness of safety hazards and reduce risk and to provide comment and context to safety issues that were of interest to the media.

Table F-1: MEDIA RELATIONS ACTIVITIES

DATE	TITLE	ACTION	INDUSTRY SECTOR	SYNOPSIS
January 15	BCSA releases recommendations following investigation into Babine Forest Products explosion and fire	Media release and media interviews	Electrical	BCSA released a recommendations report on its investigation into the January 20, 2012 explosion and fire at Babine Forest Products near Burns Lake BC. While the release did not specify any technology, some recommendations were related to the Canadian Electrical Code and there were links to two safety orders affecting electrical equipment.
February 13	2012 Summary of Enforcement Actions	Media release	All except Railways	Sent to trade publications to inform clients/industry about enforcement activities. In 2012, BCSA took 129 enforcement actions against contractors, equipment owners and others doing work in BCSA regulated industry sectors for failing to comply with safety requirements and unlawfully performing regulated work.
March 12	Vye Road Rail Crossing	Media release support	Railways	BCSA provided content and advice to the Abbotsford RCMP for their YouTube video regarding safety at the Vye Road Rail Crossing.
March 22	Crossing arms address safety issues at Abbotsford's Vye Road crossing	Media interview	Railways	BCSA railway safety manager provided comment and context to a media inquiry regarding the installation of crossing arms at Abbotsford's Vye Road crossing.
April 24	Update: ASTTBC Request for Recognition of Training for Limited Scope Electrical Workers	Statement	Electrical	BCSA provided an update on the status of recognition of training programs administered by the Applied Science Technologists and Technicians of BC (ASTTBC). After the initial review of ASTTBC's application, the provincial safety manager was satisfied that all electrical safety aspects of this limited scope work would be sufficiently covered under the proposed program and approval was granted subject to some conditions.
May 7	Lakeland Mills Investigation Report & Safety Order	Statement	Electrical	BCSA completed its investigation into the April 23, 2012 explosion and fire at Lakeland Mills in Prince George BC. The investigation results are not being released at this time to avoid compromising Crown Counsel's review of a referral from WorkSafeBC.
May 8	Babine Investigation Report – BC Safety Authority Statement	Statement	Electrical	BCSA issued a statement to clarify its decision not to release the full Babine investigation report to avoid compromising Crown Counsel's review of a referral from WorkSafeBC.
May 16	Stay safe at the cottage or campsite this long weekend	Media release	Gas	BCSA released safety tips prior to the Victoria Day long weekend ranging from carbon monoxide information to the proper use of gas equipment on RVs.
May 24	Gas and electrical equipment safety in floods	Media release	Electrical, Gas	BCSA released these tips to the central interior and northern regions where flooding was expected. BCSA reminds homeowners and businesses to take precautions with gas and electrical appliances when flooding is expected.
Spring issue	Counterfeiting:Protecting Electrical Safety in British Columbia	Article	Electrical	A BCSA electrical safety officer submitted an article to Connector, the BC Electrical Association newsletter, to emphasize how counterfeit electrical products negatively affect the electrical industry in BC, and to provide contractors with the tools to identify and avoid counterfeit products.
June 24	Professionalism in the construction industry	Media interview	Electrical, Gas, BPV, Elevating Devices	BCSA president & CEO provided comment and context for a Canadian Home Builders Association (CHBA) BC Homes Magazine story on professionalism in the construction industry.
June 24	BC Safety Authority responding to floods	Media release and media interviews	Electrical, Gas	In response to flooding in the Kootenays and Central Interior, BCSA issued safety information about post-flood safety. BCSA director for operations & service excellence also provided comment and context during a radio interview on this topic.
June 25	Stay safe at the campground or cottage this Canada Day	Media release	Gas	BCSA released safety tips prior to the Canada Day long weekend ranging from carbon monoxide information to the proper use of gas equipment on RVs.
July	Propane safety tips	Article	Gas	BCSA communications officer provided propane safety tips for Chevron's Burnaby Refinery Neighbourhood News.
July 2	Safety Order: Combustible Dust Hazard in Wood Processing Facilities	Media interviews	Electrical	BCSA director for technical programs provided comment and context during a radio interview about the safety order: Combustible Dust Hazard in Wood Processing Facilities
July 11	Amusement Devices Safety	Media interview	Amusement Devices	BCSA amusement devices safety manager provided comment and context during a media interview about the safety of amusement devices in BC.

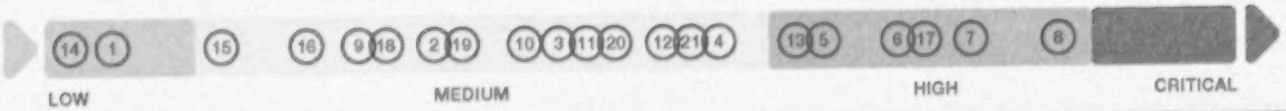
Appendix F: Media Relations Activities Cont'd

Table F-1: MEDIA RELATIONS ACTIVITIES CONT'D

DATE	TITLE	ACTION	INDUSTRY SECTOR	SYNOPSIS
July 25	Reconstruction begins on destroyed BC sawmill	Media interview	Electrical	BCSA leader for communications & media relations provided comment and context during an interview with a trade publication regarding BCSA's decision not to release the full Babine and Lakeland investigation report to avoid compromising Crown Counsel's review of a referral from WorkSafeBC.
July 29	BC Safety Authority takes 48 enforcement actions in the first half of 2013.	Media release	All except Railways	Sent to trade publications to inform clients/industry about enforcement activities. BCSA took 48 enforcement actions against contractors, equipment owners and others doing work or using regulated equipment in BCSA-regulated technologies in the first half of 2013.
August 19	Practice of propping up roller coasters on wooden blocks	Media interview	Amusement Devices	BCSA leader for communications & media relations provided comment and context during a media interview regarding the practice of using wood blocking to support a portable amusement ride, which is a common practice in the amusement ride industry.
August 28	BCSA investigates fatal explosion at legal grow operations	Media interview	Electrical, Gas	BCSA leader for communications & media relations provided comment and context during a media interview regarding BCSA's investigation into a fatal explosion at a legal grow operations.
September 10	Honouring Those Who Enhance Safety in BC	Media release and media interview	All	BCSA released a call for nominations for the Lieutenant Governor Safety Awards 2013. BCSA president & CEO also provided comment and context during a radio interview on this topic.
September 12	Oversight for suspension bridge safety on Kelowna Mountain	Media interview	Passenger Ropeways	BCSA communications officer provided comment and context during a media interview about the work and involvement of BCSA with a major property development on Kelowna Mountain.
September 27	Safety around railway crossings in the Lower Mainland	Media interview	Railways	BCSA communications officer provided comment and context during a media interview about incidents that occurred at Lower Mainland railway crossings, including safety tips for pedestrians and vehicle operators.
October 02	Oversight for ski lifts on Kelowna Mountain	Media interview	Passenger Ropeways	BCSA communications officer provided comment and context during a media interview about the work and involvement of BCSA with a major property development on Kelowna Mountain.
October 11	Keeping gas appliances safe in preparation for an earthquake	Media interview	Gas	BCSA gas safety officer provided tips on how to keep gas appliances safe in a media interview as part of a story on ShakeOut BC.
October 11	Update: ASTTBC Request for Recognition of Training for Limited Scope Electrical Workers	Media interview	Electrical	BCSA electrical safety manager provided an update, comment and context on the status of recognition of training programs administered by the Applied Science Technologists and Technicians of BC (ASTTBC).
October 23	BCSA warns of uncertified Riske Creek Trailers	Media release and media interviews	Gas	BCSA released a warning regarding uncertified trailers. BCSA gas safety manager and senior gas safety officer also provided comment and context for several media interviews regarding this topic.
October 29	Homeowner concerns regarding work done by a contractor	Media interview	Gas	BCSA communications officer provided context during a media interview about work done by a contractor. The interview was triggered by concerns raised by a homeowner.
November	Safe Technical Systems. Everywhere.	Article	Electrical, Gas, BPV and Elevating Devices	BCSA president & CEO provided the Educational Facilities Managers Association of BC - Ops Talk with an article on risk managing complex technical systems.
November 13	Safety Order asking home park owner to address safety issues	Media interview	Electrical	BCSA communications officer provided context during a media interview about safety issues and BCSA actions affecting a home park.
November 14	Six recipients announced for BC Safety Authority's Lieutenant Governor Safety Award	Media release	All	BCSA released information regarding the recipients of BCSA's Lieutenant Governor Safety Award.
November 29	Oversight for suspension bridge and ski lifts at Kelowna Mountain	Media interview	Passenger Ropeways	BCSA communications officer provided comment and context during a media interview about the work and involvement of BCSA with a major property development on Kelowna Mountain.
November 29	Six recipients to be honoured for safety excellence at BC Safety Authority's Lieutenant Governor Safety Awards	Media release	All	BCSA announced that the recipients of BCSA's Lieutenant Governor Safety Award will be honoured in an awards ceremony.
December 03	BCSA warns of dangers of carbon monoxide	Media release and media interview	Gas	BCSA released safety tips to manage risks involving carbon monoxide in preparation for the winter season. BCSA gas safety manager provided comment and context during a media interview on this topic.
December 09	Incidents caused by static electricity	Media interview	Electrical	BCSA communications officer clarified that static electricity is covered by the Fire Code and is best addressed by the Office of the Fire Commissioner.
December 11	Oversight for ice rinks safety and update on investigation of a 2011 ammonia leak incident	Media interview	BPV	BCSA regional business leader provided comment and context during a media interview about safety oversight for ice rinks and an update on the investigation of a 2011 ammonia leak incident. Prior to the interview, BCSA BPV safety manager explained the process that could lead to an ammonia leak.

Appendix G: Technical Risk Register

APPENDIX G: TECHNICAL RISK REGISTER



INDUSTRY	NUMBER	RISK	CONTEXT
BOILER PRESSURE VESSELS AND REFRIGERATION	1	Management of Equivalent Standards Agreements (ESA)	Some units under the ESA are being installed without registration or first certification.
	2	Poor contractor licence renewal process	Licensed contractors are receiving annual renewal without an audit of their quality management systems.
	3	Ice skating facilities operating without required staffing	Recreational ice skating facilities may be operating without required staffing levels or being registered as special status plants.
ELECTRICAL	4	Unpermitted homeowner work	Unpermitted homeowner work is not inspected or the risk is not controlled.
	5	Electrical operating permits - low market penetration	Owners operating electrical systems may not be complying with safety and permitting requirements.
	6	Untrained individuals performing electrical work	Unqualified or inadequately trained individuals are performing electrical work.
	7	Explosion hazard areas with combustible wood dust	Explosion may occur where electrical equipment is located in areas with hazardous levels of combustible wood dust.
	8	Field safety representatives' (FSR) code knowledge	Potential unsafe practices by FSR due to their lack of up to date knowledge of codes and standards.
ELEVATING DEVICES	9	Permit holders do not perform safety tests	Elevating safety impacted because the permit holders (owners and contractors) do not perform required safety tests in the required code and frequencies.
	10	Vacancies created by safety officers retiring from BCSA	Ability to attract competent elevating safety officers to BCSA to replace those who will be retiring in 3 to 5 years.
	11	Failure of hydraulic elevator controller	Hydraulic elevator controller may fail to regulate the release of pressure resulting in rapid descend while the car is in inspection mode.
	12	Failure of single bottom cylinder	Single bottom cylinder elevators may result in catastrophic incidents.
	13	Lack of Elevating Mechanic Certification process	Elevating mechanics are not certified. There are no standards for education and examination requirements.
GAS	14	Underground gas line hits	Homeowners and contractors may damage underground gas pipes.
	15	Unpermitted small utilities	Small utilities (for example, stratas and residential sub divisions) may not have valid operating permits.
	16	Unsafe handling of gas equipment by the public	Public may not operate gas equipment safely (for example, propane cylinders, boilers and furnaces).
PASSENGER ROPEWAYS	17	Lack of formal training for passenger ropeways technicians	Public safety may be affected because formalized training and recognized certification for passenger ropeways (PR) technicians does not exist.
RAILWAYS	18	Railway Program jurisdiction clarity	Lack of clarity in legal responsibility and authority between BCSA and the Provincial Government.
	19	Railway trespass	Threats to public safety arising from trespassing on railway lines.
	20	Unregulated sidings and spurs	Lack of regulatory control on private sidings and spurs.
	21	Lack of oversight by operators on the training of their employees	Inadequate training by the operators given to employees in safety critical positions working on provincial industrial railways.

Appendix H: Local Government Administration of the *Safety Standards Act*

The Province of British Columbia has delegated partial administration of the *Safety Standards Act* to a number of local governments.

Local governments that have administrative responsibility for the electrical technology:

- City of Burnaby
- City of North Vancouver
- City of Surrey
- City of Vancouver
- City of Victoria
- Corporation of the District of Maple Ridge
- District of North Vancouver
- Municipality of West Vancouver

Local governments that have administrative responsibility for the gas technology:

- City of Burnaby
- City of Kelowna
- City of North Vancouver
- City of Richmond
- City of Vancouver
- Corporation of the District of Maple Ridge
- District of North Vancouver

Local governments that administer gas assessment programs for detached dwellings with gas services at a pressure of 14.0 kPa gauge or less as well as other buildings with gas services at a pressure of 14.0 kPa gauge or less with a total connected load for the meter of 120 kW or less.

Appendix I: Definitions

Assessment
An evaluation or review of information relating to regulated work, product or equipment. Key BCSA activities in Assessment are:

- gathering of information through inspections or physical assessments (of reported hazards and work performed by contractors or homeowners);
- gathering of evidence through incident investigations;
- gathering of evidence through audits or documentation evaluations (of safety management plans for example);
- reviews of requests for permission (such as permit or ASA applications);
- reviews of declarations and reports from duty holders (includes incident reports);
- reviews of qualifications for licensing or certification; and
- reviews of product or equipment and designs when approving these for use in BC.

Audit
An independent, systematic review supported by objective evidence that is focused on a system or process.

Certificate of inspection
A document issued by BC Safety Authority upon completion of an inspection. This document identifies any noncompliance with respect to the regulated work or regulated product that must be corrected by the permit holder.

Certificate of qualification
A certificate issued by BC Safety Authority to an individual who provides evidence of his/her knowledge and ability to do regulated work in a manner that meets the requirements under the *Safety Standards Act* and which allows an individual to perform regulated work in British Columbia within the scope of the certificate.

Compliance order
A document issued to a person or company by a BCSA safety officer or safety manager that specifies actions to be taken, stopped or modified.

Directive
A regulatory instrument that clarifies or provides new interpretation, application or operation of a regulation or code. Compliance is mandatory.

Discipline order
A document issued by BC Safety Authority to a person performing regulated work who:

- is in breach of a condition of, or restriction on, any licence or permission;
- practices in a discipline under the *Safety Standards Act* for which the contractor is not licensed or qualified;
- fails to comply with a compliance order or safety order;
- fails to comply with a requirement, term or condition of an Alternative Safety Approach, or;
- is convicted of an offense under the *Safety Standards Act*.

Duty holder
A person who is responsible for compliance because they either own or work on regulated equipment, products or assets according to the *Safety Standards Act*.

Incident
An event that occurred as a result of regulated work or equipment that either caused death, personal injury or damage to property, or created a risk of personal injury or damage to property.

Severe incident - An event that either caused or was likely to have caused fatal or permanent injury. Severe incidents may also be referred to as "Level 1" incidents.

Major incident - An event that either caused or was likely to have caused major injury and/or extensive property or equipment damage. Major incidents may also be referred to as "Level 2" incidents.

Minor incident - An event that caused or was likely to have caused minor injury and/or minor property or equipment damage. Minor incidents may also be referred to as "Level 3" incidents.

Note: Incidents identified as UNDER INVESTIGATION were open at the time of report preparation. Information related to open investigations is subject to change and verification therefore discussion of these incident details is excluded.

Information bulletin
A document issued to provide helpful information and clarification on existing regulations or codes.

Injury
Any physical damage to the body caused by an event that occurs as a result of regulated work or equipment, further classified as:

Fatal injury - An injury causing death.

Major injury - An injury that involves long-term impairment of function or loss of function of any body part, organ or mental faculty, significant physical pain and some disability or loss of function; examples include fractures, internal injuries or wounds that are serious but may be not life-threatening, or considerable exposure to noxious substances. Medical attention is required.

Minor injury - A non-permanent injury that may require some medical or first-aid treatment; examples include lacerations, contusions, abrasions, or other injuries that have no residual effect. Further professional medical attention is not usually required.

Inspection
A type of assessment where the regulated product, equipment or work has been directly evaluated by BC Safety Authority.

Installation permit
A permission that is required to install or alter a regulated product. An installation permit may be issued to a licensed contractor, a person who holds an operating permit, an owner of a regulated product or a homeowner who performs regulated work as permitted under the regulations.

Licence
A permission that allows a person, company or corporation to perform regulated work.

Monetary penalty
An administrative penalty issued by a BCSA safety manager to a person or company for specific non-compliance(s), in amounts up to a maximum of $100,000.

Non compliance
A failure of a regulated product or work to conform with applicable Acts and Regulations.

Operating permit
A permission issued by BC Safety Authority that allows the operation and maintenance of a regulated product. An operating permit may be issued to the owner of a regulated product or building where regulated work is to be performed.

Physical assessment
The same as an inspection, this is an assessment where the regulated product or work has been directly evaluated by BC Safety Authority.

Railway accident
An event that results in injury or damage relating to the railway's operations.

Railway classes
types of railways regulated by BC Safety Authority:

Common carrier railways transport passengers and/or goods and interchange common rolling stock with other railways.

Commuter railways exclusively provide rail transportation for passengers in or between urban and/or suburban locations.

Heritage railways operate or move only railway equipment of historical significance.

Industrial Siding and Spur railways exclusively serve and move railway equipment at industrial sites or as designated by the authority having administrative responsibility.

Industrial railways exclusively serve and move railway equipment through track switches at industrial sites or as designated by the authority having administrative responsibility.

Railway incident
An event where there is no damage or injury but the potential existed for either or both to occur and the cause is related to non-compliance with the approved rules, regulations, guidelines, policies or procedures of the railway or external events or activities beyond the control of the railway.

Reportable railway accident
means an accident resulting directly from operation of rolling stock, where:

(a) A person sustains a serious injury or is killed as a result of

1) being on board or getting on or off the rolling stock, or

2) coming into contact with any part of the rolling stock or its contents; or

(b) The rolling stock

1) is involved in a grade crossing collision, (all crossing accidents are reportable with or without injuries or fatalities)

2) is involved in a collision or a derailment,

3 sustains damage that affects its safe operation, or

4) causes or sustains a fire or explosion, or causes damage to the railway, that poses a threat to the safety of any person, property or the environment.

Reportable railway incident
An incident resulting directly from the operation of rolling stock where:

- a risk of collision occurs;
- an unprotected main track switch is left in an abnormal position;
- a railway signal displays a less restrictive indication than required for the intended movement of rolling stock;
- an unprotected overlap of operating authorities occurs;
- the movement of rolling stock exceeds the limits of its authority;
- there is runaway rolling stock;
- any crew member whose duties are directly related to the safe operation of the rolling stock is unable to perform the crew member's duties as a result of a physical incapacitation that poses a threat to any person, property or the environment; or
- any dangerous goods are released on board or from the rolling stock.

Safety order
A regulatory instrument issued to prevent or reduce the risk of personal injury or damage to property. Compliance is mandatory.

Safety Standards Administrators' Group
An advisory body comprised of representatives of the ten municipalities that administer the electrical or gas areas of the *Safety Standards Act* (See Appendix H). The Safety Standards Administrators' Group's role is to share safety information, standardize processes and interpretations, and ultimately to promote greater consistency in provincial safety management.

Sanction
An action issued to a person or company to correct non-compliant behaviour. Types of sanctions include monetary penalties, discipline orders, or other restrictions issued by a safety manager.

Technology Advisory Committee
A non-decision-making body comprised of volunteer industry representatives that has a role of identifying and advising BC Safety Authority on issues related to technical safety, regulatory change and service delivery.

Warning notice
A document issued to a person or company by BC Safety Authority identifying non-compliant behaviour and further advising that future non-compliance of a similar nature will result in progressive enforcement action.

Working group
A group of industry subject matter experts formed to address a specific safety issue, activity or project. Working groups research, analyze and make recommendations on a specific safety aspect to their respective technology advisory committee and may be dissolved when the outcome is delivered.

BC Safety Authority

Safety Authority

State of Safety Report 2013

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